

# THE AMERICAN JOURNAL OF PHARMACY

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MARCH, 1894.

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## CRUDE CARBOLIC ACID.

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The composition and methods of preparation of the crude carbolic acids of commerce appear to be so little understood by pharmacists generally that it seems as if a few remarks about them, from one who has practical knowledge of their manufacture, might be of interest to those present.

Many text-books state that crude carbolic acid is prepared by repeatedly distilling a portion of the coal tar, until a fraction is obtained boiling between 170–190° C., which is then extracted with a strong solution of caustic soda. This method is not used at present in large works either here or abroad.

While it is possible to obtain a fraction rich in acids by repeated distillation, yet the total yield is less, for a certain amount is lost in each distillation, either by volatilization, or by being destroyed by contact with the heated sides of the still.

In this country, as a rule, the tar is distilled in two fractions. The first consisting of all the lighter portions is called the light oil, and is collected until a sample of the oil that runs from the still sinks in water. The whole fraction when mixed has a gravity of from 0.94 to 0.99. The second fraction consisting of about 20 per cent. of the tar, constitutes the creosote—or heavy oil—commonly called dead oil. The residue left in the still is soft pitch. In some cases the first portions of the dead oil are collected separately, in order to obtain a fraction as rich in acids as possible, which is then known

as carbolic oil. The light oil which boils between 90 and 250° C. contains from 4 to 10 per cent. of acids, and therefore nearly all of the carbolic acid, or true phenol, boiling at 182°.

The dead oil contains from 10 to 20 per cent. of acid, the carbolic oil, if made, sometimes shows as high as 30 per cent. These oils contain also a certain amount of carbolic acid, but the proportion is much less than in the light oil.

In Europe, where most of the crystal carbolic acid is made, the fractions are collected differently. The first portion running from the still containing most of the benzol and toluol is called crude naphtha or first runnings. The second portion, which is collected as long as the distillate is lighter than water, is called light oil or second runnings, and is very rich in phenol. The third fraction constitutes the carbolic oil. The portion to be extracted is agitated with a weak solution of caustic soda, about 10 per cent. is the right strength. If a strong solution is used, many impurities contained in the oils, especially naphthaline, are also dissolved and contaminate the finished acid. After agitation the mixture on standing separates into two layers—the upper consisting of the extracted oil—the lower the solution of carbolate of soda. This latter is drawn off, and on acidifying with either sulphuric or hydrochloric acid, the tar acids are liberated, and float on the surface as an oily layer, holding more or less water in solution, depending on the nature of the acid present. For convenience in consideration, we will arbitrarily divide the crude acids into two classes.

- (1) Crude acids for the manufacture of crystal carbolic acid.
- (2) Crude acids for disinfecting purposes.

Acids of the first class are not a regular commercial article in the United States, as there is only one firm manufacturing crystal carbolic acid, but in Europe, especially in England, they are prepared on a very large scale. As their value depends on the amount of crystal acid they contain, they are sold by test. Crystal carbolic acid being the first of the series of phenols has the lowest boiling point. Therefore, the boiling point of a crude acid is to a great extent an indication of its value.

In England, an arbitrary method has been devised by Lowe, which gives an approximate idea of the value of these acids. A sample (say 100 cc.), is distilled in a retort or flask. At first water passes over, then an oily liquid. When 10 cc of this latter have been col-

lected, the receiver is changed, and the next 62½ cc. collected apart. The residue in the retort is cresylic and higher acids. The 62½ cc. obtained as a second fraction is cooled, and the solidifying point ascertained by a thermometer placed in the liquid. These crude carbolic acids are sold as 50°, 60° or 70° acids, meaning thereby that the second fraction of 62½ cc. crystallizes at 50°, 60° or 70° F. That containing the most crystal acid showing the highest melting point.

A good quality of 60° English crude carbolic acid distilled as follows:

	Per Cent.
To 180, . . . . .	17 (11 p. c. water)
" 185, . . . . .	21
" 190, . . . . .	71
" 195, . . . . .	88
" 200, . . . . .	93
" 205, . . . . .	95

The portion representing the 62½ cc. distilling between 184°¾ and 193°.

A very good grade of light oil must be used to obtain such an acid, if a higher fraction of the tar is extracted, the acid obtained shows a correspondingly higher boiling point.

The following acid was extracted from the first portions of the dead oil:

	Per Cent.
To 180, . . . . .	14 (11 p. c. water)
" 190, . . . . .	20
" 195, . . . . .	55
" 200, . . . . .	74
" 205, . . . . .	82
" 210, . . . . .	88
" 220, . . . . .	91
" 230, . . . . .	93

The 62½ cc. of this acid did not crystallize until cooled to 25° F. If insufficient soda is used, it would be possible to extract, even from an oil of this nature, a certain amount of acid rich in phenol. Phenol has a greater affinity for soda than its homologues, therefore, if one-half the soda necessary for complete extraction is used, the solution will contain a greater proportion of phenol than if the material was extracted completely.

This is clearly shown by the following experiment. A sample of

oil was treated with three equal portions of weak caustic soda solution, the last portion extracting the oil completely.

Each solution was neutralized with sulphuric acid, and the resulting acids distilled. In order to show their composition more clearly the result is calculated after deducting the water present.

Acid from :

	First Portion. Per Cent.	Second Portion. Per Cent.	Third Portion. Per Cent.
To 180, . . . . .	6	—	—
" 185, . . . . .	30	—	—
" 190, . . . . .	74	1	—
" 195, . . . . .	86	41	2
" 200, . . . . .	91	71	16
" 205, . . . . .	94	83	54
" 210, . . . . .	—	87	74
" 215, . . . . .	—	91	84
" 220, . . . . .	—	—	88
" 225, . . . . .	—	—	92

The first portion is equal to a 60° acid, and contains a large amount of phenol; the third portion, none at all. To prepare crystal acid from these crude materials, they are carefully rectified in large iron stills, the watery portions separated, and the fractions from (say) 180° to 190° cooled, the phenol crystallizes and is drained from the liquid portions. The crude crystals thus obtained are then carefully refined. As the crystal carbolic acid has a much higher value than the other acids, it is in the interest of the manufacturer to remove it as completely as possible. The remaining liquid acids are sold as "crude carbolic acid 100 per cent.," as they are entirely soluble in caustic soda solution, excepting traces of naphthaline and other impurities.

The lowest grades of crude acids known as 10, 15, 20 and 25 per cent., are simply unextracted portions of the heavy oil, containing this amount of tar acids. The higher grades, 50, 60 and 70 per cent., are prepared by adding 100 per cent. to the lower grades.

As the heavy oils used in mixing these acids contain a large number of bodies, these are of course present in the commercial acids. The most important of these are the pyridine bases and naphthaline. The former gives to certain acids a rank, disagreeable smell. The latter is generally present in large amounts, some oils consisting of more than half crude naphthaline. In cold weather this anphthaline is deposited, and as the liquid portions are drawn off, it



finally remains in the barrels as an oily mass, which will not again become liquid, thereby occasioning a serious loss to the purchasers. It does not appear to be generally understood that these acids consist largely of oil, for it is a common occurrence to find disinfecting acids in bottles, labelled with directions for mixing with water, when a test shows that it is entirely insoluble in water, and contains only a small percentage of acid.

Many methods of testing crude carbolic acids have been proposed, which apparently ignore the large per cent. of oil present.

An instance of this is the method recently proposed by Seiler, and which has been extensively copied by journals throughout the country.

His method is to weigh 100 grams of the sample in a large beaker, adding milk of lime (obtained by slaking 200 grams of lime) and diluting to one liter. The whole is placed on a water-bath and stirred for an hour, after which the same amount of water is again added, when cold it is filtered, washed with fresh water and filtered again. The acid is liberated by hydrochloric acid, salt being added to the solution to remove as far as possible the acid dissolved in the liquor. It is then separated and weighed. He sums up the result of his investigation by stating that an acid sold as 25-30 per cent. showed only 2 to 3 per cent.; a 40-60 per cent. acid gave 3 to 5 per cent.; a 50-80 per cent. and a 90-100 per cent., 80 per cent. From this he concludes that commercial acids contain considerably less than stated, and that the lower grades are worthless.

To one acquainted with the nature of crude carbolic acids, the defects of this method are at once apparent. The slaked lime on mixing with the acid forms an oily mass, from which it is nearly impossible to extract any acid. Lime is too weak a base to extract the last portions of acid from the oil, and the voluminous liquid, amounting with the wash waters to about three liters, dissolves a large percentage of the acid even when saturated with salt.

It will be noted that the crude acid said to contain the larger amounts, gave better figures than the low grades, which was to be expected, as there was about the same amount dissolved in the salt solution from that acid that should have given 25 cc. of acids, as from that which should give 100 cc.

As these crude acids are only for disinfecting purposes, and as cresylic and the higher acids are now recognized to have the same,

if not better, disinfecting properties than phenol, it does not seem necessary to determine any other point than the total per cent. of acid they contain. No simpler method can be devised than the well known one of shaking a certain quantity of the material in a graduated vessel, with weak caustic soda, and noting the decrease in volume. To verify the result the soda solution can be acidified and the tar acids measured. The amount liberated is always less than that indicated by the decrease of the volume of oil, owing to the solubility of the acid in the salt solution.

For this test I would recommend a 100 cc. burette, divided in tenths, and furnished with a glass stop-cock. It is filled to the 50 cc. mark with 10 per cent. of caustic soda solution; 25 or 50 cc. of the acid to be tested is then added, the burette closed with a cork and well shaken. On allowing to stand, the decrease in the volume of oil is readily measured; 50 cc. soda of the strength indicated is sufficient to saturate 12 cc. of 100 per cent. acid. If it is necessary to add more soda the already saturated solution can be readily drawn from the burette and another 50 cc. added.

Frequently the percentage of naphthaline in low grade acids is so great that it separates from the liquid as soon as the acids are removed; as this prevents an accurate reading, it is necessary to add 10 to 15 cc. of benzol to dissolve the deposit.

In some cases the acids are contaminated with tarry or resinous bodies, which dissolve in the caustic soda, rendering the solution so dark that it is impossible to see the line separating the two liquids. In this case it is advisable to distil another 25 cc. portion nearly to dryness in a small flask, considering the distillate as 25 cc., and repeating the test. The entire operation requires but a few minutes, and the results of many hundred trials show it to be accurate enough for general purposes.

A mixture of equal parts of heavy oil and cresylic acid was made, and tested by the above method. The contraction showed 49½ per cent. of acid present, the liberated phenols gave 49 per cent. The same mixture tested by Seiler's lime method, gave only 22 per cent. every precaution being taken to insure a good result.

Another mixture prepared with 25 per cent. of acid, gave 24½ per cent. by extraction, and 24 per cent. of phenols set free. The lime method gave but 6 per cent.

The Pharmacopœia requires that 50 volumes of a crude acid

mixed with 950 parts of water, should not leave undissolved more than five volumes or 10 per cent. It is difficult to understand for what reason such an arbitrary test is required. Fifty cc. of insoluble residue in 1,000 cc. of solution is difficult to measure with accuracy, particularly as the acid often adheres in fine globules to the sides of the measure. This may seem a small objection, yet it is very important when the acceptance or rejection of a large lot of acid depends on it.

A sample of excellent 60° crude carbolic acid was tested by the method of the Pharmacopœia, and answered its requirements, about four volumes remaining undissolved. Another portion of the same acid was then distilled to remove the small amount of tarry matter and about 11 per cent. of water present. This fine light-colored acid showed by the Pharmacopœia test fifteen volumes or 30 per cent. insoluble. In other words, an acid containing all the best portions of the first sample and having 15 per cent. more value as a disinfectant would not stand the test.

A sample of distilled cresylic acid, free from water, distilling to

	Per Cent.
190, . . . . .	12
195, . . . . .	70
200, . . . . .	88
205, . . . . .	97

gave 25 volumes or 50 per cent. insoluble. It was found necessary to add 75 per cent. of crystal carbolic acid (melting point, 35°) to 25 per cent. of the above cresylic acid, before a mixture could be obtained which would give a satisfactory result.

As the Pharmacopœia requires an acid for disinfecting purposes only, and not for preparing crystal acid, it is useless to require such a high per cent. of phenol, and it would be undoubtedly to the purchaser's interest to buy an acid free from water. If the idea is to prevent the use of the higher boiling phenols, which are very little soluble in water, the difficulty could be overcome by the following requirements:

It should not be soluble in less than 15 parts water at 15° C., and the aqueous solution should not have an alkaline reaction. It should dissolve in 10 per cent. caustic soda solution, leaving not over 5 per cent. insoluble. Should not show over 2 per cent. water, and 90 per cent. should distil under 225° C.

## EUPARIN.

BY CHARLES C. MANGER.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.  
No. 130.

This compound, from *Eupatorium purpureum*, was described by Professor Henry Trimble, in the American Journal of Pharmacy, 1890, p. 73.

The history and method of preparation were then described. From the results obtained in the investigation at that time, the empirical formula ( $C_{12}H_{11}O_3$ ) was assigned it, but it was not possible to classify it with any of the known plant compounds. With a view of adding something to our knowledge concerning it, this work was undertaken on a liberal supply of the crude material furnished by Professor Lloyd, of Cincinnati, and by Mr. E. G. Eberhardt, of Indianapolis.

The substance supplied was purified by digesting an alcoholic solution of it with animal charcoal and subsequently recrystallizing.

By these treatments the euparin was obtained in acicular or prismatic crystals which melted constantly at  $116^{\circ}C$ .

That the purity of these might be further proven, the substance was submitted to ultimate analysis. The following was the average of the results of the several combustions which were made:

	Found Per Cent.	Calculated for ( $C_{12}H_{11}O_3$ ). Per Cent.
Carbon, . . . . .	70.80	70.94
Hydrogen, . . . . .	5.31	5.42
Oxygen, . . . . .	23.89	23.64

When carefully heated the crystals sublimed.

Euparin was found to be insoluble in water, sparingly soluble in petroleum ether, readily soluble in ether, chloroform, benzol and acetone. When water was added to its solution in the last-named solvent the euparin appeared to be precipitated in direct proportion to the degree of dilution, although the very dilute solution still retained traces of the substance.

Ten per cent. aqueous solution of potassium hydrate dissolved the crystals, but dilution with water precipitated the substance, apparently unchanged.

Ferric chloride gave a grass green color with an alcoholic solution of euparin.

Hot concentrated sulphuric acid gave a black solution of the substance. Cold acid of the same strength gave a red colored solution, which appeared dark yellow in thin layers, and from which water precipitated a green plastic mass. The unfiltered mixture was shaken with ether in which the green mass was insoluble, and with which it was separated. The ether was allowed to evaporate spontaneously, and the residue and the plastic mass were treated with boiling alcohol, which dissolved nearly all the substance, and from which it was deposited upon cooling.

The green plastic mass and the residue left upon the evaporation of the ether were examined for sulphur by fusing with potassium hydrate and potassium nitrate, but after dissolving the products of the fusions in water and supersaturating the alkali with nitric acid, no precipitate was obtained in either case with barium chloride, indicating the absence of a sulphur derivative. After having been boiled with one per cent. sulphuric acid for six hours, euparin retained its original appearance and answered its usual reactions. The acid liquid, when filtered and made alkaline with sodium hydrate gave no indication of glucose when heated with Fehling's solution. In order to gain some idea of the constitution of euparin, the following substitution products were made.

#### CHLORINE SUBSTITUTION PRODUCT.

Purified chlorine was passed into a solution of 7 grams of the crystals in absolute ether.

Upon standing, the liquid deposited nothing, but upon spontaneous evaporation, a thick yellow liquid of unstable character was obtained.

This became hard and somewhat brittle, but showed no signs of crystallizing, when exposed to a temperature of  $-16.6^{\circ}\text{C}$ .

It was soluble in alcohol from which it separated when the solution was chilled to  $-15^{\circ}\text{C}$ . This solution gave a blood red color with ferric chloride.

The substitution product was somewhat darkened by treatment with potassium hydrate, and imparted a yellow color to that liquid, but upon acidification with nitric acid silver nitrate revealed but traces of chlorine.

Ammonium hydrate acquired a dark red color when brought into contact with the compound which it partly dissolved. When this



liquid was made acid with nitric acid and silver nitrate was added, a bulky precipitate of silver chloride was produced.

That part of the product which was insoluble in ammonium hydrate, had a grayish-black appearance. Estimation of the chlorine in the substitution product. A mixture of this substance and chlorine—free calcium carbonate was heated to redness for two hours. The tube and its cooled contents were treated with water and then with nitric acid in excess. The solution was filtered and the broken glass rinsed with water which was passed through the filter and added to the solution which was next completely precipitated with silver nitrate. The silver chloride was collected, washed thoroughly and dried at 130° C.

4.142 grams of the compound gave 6.443 grams of silver chloride. This amount of silver chloride contains 1.5905 grams of chlorine or 38.48 per cent. of the weight of the substitution product.

Assuming that chlorine replaces an equal number of hydrogen atoms in the molecule  $C_{12}H_{11}O_3$ , this would at least require the molecule  $C_{24}H_{22}O_6$  in which seven hydrogen atoms have been replaced, giving  $C_{24}H_{15}Cl_7O_6$ . This formula represents 38.31 per cent. of chlorine.

#### ACETYL DERIVATIVE.

Five grams of euparin were boiled with 5 grams of anhydrous sodium acetate and 10 cc. of acetic anhydride for two hours. When the resulting liquid was poured into water a heavy oily layer separated. This was washed with several successive portions of water and finally dried, over sulphuric acid, in a desiccator.

When cooled to  $-15^{\circ}C.$ , the substance became a crystalline mass, but reassumed its original form when the refrigeration was discontinued, and, when heated in a paraffin bath to  $125^{\circ}C.$ , it was decomposed.

When heated on platinum foil, the liquid gave off an acetous odor, burned with a luminous flame and left a minute residue of sodium carbonate.

The sodium salts were separated by treating the material with later and shaking the mixture with ether, which dissolved the acetyl compounds and upon spontaneous evaporation left it in the fluid condition. When freed from sodium salts, the product became denser, but did not crystallize at a low temperature.



A second quantity of the substitution product was made in the same manner as employed for the first, but with the omission of the sodium acetate. The resulting compound had the general characters of the previous sample and became dark red—through the composition—when dried over calcium chloride.

On account of the unstable character of this substance, no definite knowledge of its composition was gained from the results of combustions and of estimations of acetyl which were made.

#### NITRO COMPOUND.

Euparin was treated with hot nitric acid (sp. gr. 1.40), the resulting dark red liquid diluted with water and the copious flocculent precipitate obtained was dissolved in potassium hydrate. The alkaline liquid was acidified with dilute sulphuric acid and shaken with the ether, to which it imparted a yellow color. Upon drawing off and evaporating the ether, yellow crystals mixed with some brownish substances were obtained.

These crystals fused and became black between 121° and 123° C.

They were soluble in water and the yellow color of the solution was intensified by alkalis.

The aqueous solution had an acid reaction and a bitter taste. It colored the skin yellow and dyed wool and silk the same color.

The following tests for picric acid were obtained with the water solution :

Normal lead acetate, no precipitate.

Basic lead acetate, yellowish precipitate.

Ammoniacal copper sulphate, dark green color, upon standing a precipitate was produced.

Ferric chloride, brownish-red precipitate.

Potassium cyanide, purplish-red color.

Quinine sulphate, yellow-precipitate.

#### ACTION OF FUSED ALKALI.

Euparin was gradually added, with constant stirring, to potassium hydrate in the fused state. The liquid became brownish-red in color and emitted an apple like odor. The cold mass was dissolved in water, the solution acidified with dilute sulphuric acid and shaken with ether which removed the color, and upon separation and evaporation left a dark red-brown residue. This was dissolved in

absolute alcohol, but upon recovery of the solvent was left in the same condition as before. The residue was almost completely dissolved by water, which afforded a solution possessing a sweetish taste and a slight acid reaction.

The following tests showed this solution to contain phloroglucol. Fehling's solution, reduced.

Ferric chloride	}	dark violet color unchanged by heat.
and		
Sodium carbonate,	}	maroon colored precipitate.
Normal lead acetate,		
no precipitate.		
Basic lead acetate, slight yellow precipitate.		
Gelatine, no change.		
Potassium permanganate, decolorized.		
Ammoniacal silver nitrate, reduced.		
Calcium hydrate, flocculent precipitate.		

#### CONCLUSIONS.

Euparin appears to form no sulphur compound with concentrated sulphuric acid. With chlorine it forms a definite but quite unstable substitution product. With acetic anhydride a very unstable liquid compound is formed.

Concentrated nitric acid converts euparin into picric acid.

On fusion with potassium hydrate, euparin is converted chiefly into phloroglucol.

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#### FAIR FORESTRY OUTSIDE OF THE UNITED STATES.

By JOS. CRAWFORD, PH.G.

Our neighbors on the north were very kind, hence we will talk about them first combined under the general term Canada, and contained in one enclosure.

They were the following, namely: Prince Edward's Island, Nova Scotia, New Brunswick, Quebec, Ontario, Northwestern Territory and British Columbia, with special mention of exhibits of Quebec, N. W. Territory and Ontario.

These showed their vast timbers by sections of the trees, cross and longitudinal, plain and polished, as well as some very large-sized boards, among them *Arbutus* wood, which is not represented in the States.

Manitoba having such a good general collection, stood on her dignity and would not accept the small space allotted her, but erected a commodious building outside the Fair Grounds on Stony Island Avenue, opposite the California Building, and there displayed her products to not only her satisfaction, but all visitors also.

A warmer neighbor, Mexico, presented to our view, a very complete set of timber specimens, mostly of dark woods, but not well classified, and having lost our Spanish somewhere en route, we did not recover it until after sampling their genuine Zapote chewing gum, then these are what we saw and read: under the South Colonnade, a Mahogany Log, 43 feet long by 41 inches square (*Swietenia Mahogani*), Ebony (*Diospyros ebenum*), Bombax (*Acacia Acapulcensis*), Mulatto wood (*Xanthoxylon Clavi-Herculi*), Guaco (*Aristolochia grandiflora*), contrasting strongly to our small species of *Aristolochia*, Linoleum (*Amyris lignalæ*), Cedar (*Cedrela odorata*), for cigar boxes, Brazil wood (*Cæsalpina crista*), Campeachy wood (*Hæmatoxylon campeachium*), Dragon's blood (*Pterocarpus Draco*), many *Magnolias*, *Schinus molle*, known as Pepper Tree, and which was used so much this past season as a decorative shrub on the Fair Grounds, especially around California Building, Cypress (*Taxodium distichum*), Pitch Pine (*Pinus communis*) and many forms of Cactus wood. To represent their oaks, of which they have many species, they showed *Quercus Virens* or Live Oak, and claim it as the most durable as well as the strongest. The Balsamo (*Myroxylon Pareira*) is one of their hardest, and used principally for railroad sills. Zopilote, an Ash (*Fraxinus trilobata*) or Turkey Buzzard Tree, is a very common one; it has a smooth brownish bark, which annually peels off, depositing itself at the base of the trunk in large quantities and emits on fermentation the odor of musk. *Mora excelsa*, one of order *Mimosæ*, yields 75 per cent. tannin, according to their statement, and is found not only in the bark, but the wood itself. They call it Granadillo.

*Spondia canescens* furnishes a very hard wood, but as they say, its great peculiarity is to concrete its sap, in amber colored crystals as hard as flint, thereby completely inutilizing the implements of the workmen. Last that I shall mention from this country is the sweetest of all chictzapotl chicle (*Sapota achras*), which forms the most beautiful evergreen tree in the country.

Here we are now in Central America, but not in Forestry Hall,

as they have their own buildings. Guatemala and Honduras in one and Costa Rica in another. The former did not lack material, but their method of exhibition was bad and also suffered much by neglect. The same could be said of Costa Rica's crude drugs, but her woods occupied conspicuous space on ground floor. They were arranged in 2 pyramids about 15 feet diameter and same height composed of tree sections and slabs, varying from 2 to 6 or 8 feet in length.

Among them we noticed Zapotillo, Laurel, Quebracho, Guayacan, Roble, 10 or 15 varieties of Cedro or Cedar, Cocobola, Sangre draco, Palma, Zapote, Manzanillo and Algarroba.

Venezuela's woods on exhibition were reduced to the number of 15 or 20, and no information was attached nor could any be obtained elsewhere.

In the Liberal Arts Building was a fine display of the natural resources of Jamaica, and prominent among them was a large number of woods in slab form and condition, no attempts at classification and nothing could be learned of them, to the great regret of those having them in charge.

Hayti had a very clever collection in her own building, arranged in the form of a large pyramid in a corner of the building and containing large specimens in natural and polished condition of these tree bearing officinal drugs or those closely allied to them. *Xanthoxylon caribbeum*, *Catalpa longisliqua*, *Bignonia arborea*, *Acacia arborea*, *Tecoma leucoxylon*, *Piper aduncum*, *Mimosa anjuscacti*, *Chiconea floribunda*, *Theobroma guozumi*, *Guaiacum officinale*, *Simaruba excelsa*, *Hæmatoxylon Campeachium*.

Trinidad, or as their genial Commissioner calls it, "The Land of the Humming Bird," showed fewer timbers but larger boards or slabs and finer colored woods than any other country. Also the only one exhibiting the Purpleheart or Amaranth, a species of *Copaifera*. This resembled very much the heart wood of our Red Cedar, but durable in color and had very small portion of white duramen.

These woods were all board size 1½ feet to 3 in diameter and 8 or 10 feet long, one-half natural, the other polished, and besides the Purpleheart were the Galba, resembling cigar box cedar, Locust, a dark red wood, Guelpha, creamy white, very close grain, resembling a maple, Tapana, reddish walnut color, and used for carriages,

Fustic, Logwood, Balata, Roble, Guava Pigeonwood, Spanish Ash and *Copaifera officinalis*.

British Guiana had a small collection of her timbers, and all highly polished.

Brazil's Forests were represented by some 441 specimens from the State of Amazon and among them, please to note Castanheira (Brazil nut) (*Bertholetia excelsa*), Copaiba, Cumara (*Dipterix odorata*) Divi Divi, Cedro, Audiroba, Saboneta (*Sapindus saponaria*), and Ucuhuba (*Myristica sebifera*). These are all useful timbers there, and few if any ever exported to this country.

Paraguay showed some 300 timbers, varying from 12 inches to 4 feet diameter, and most of them being polished slabs, from which the bark had been removed and usually of that dark color so common to that country, Brazil and Argentine.

Argentine Republic succeeded finely as a country in showing her woods, as nearly every State responded favorably to the call, about 22 altogether, also 85 or 90 individual exhibitors.

The interest manifested was entirely too great for their allotted space and about one-fourth only could be exhibited and remainder stowed away under platforms, tables, etc., and same inconveniences happened to their plants. They had 1,000 or 1,500 specimens of these and not space enough to place one in view. The timbers were of commercial slab size and mainly the dark varieties shown by private individuals, while the government showed the trees in lengths of 4 and 5 feet, with the bark remaining for one-third the length, while the remainder was half natural and half polished, so that the tree was presented in 3 conditions.

These principal ones were Algorroba for Walnut, Mistol, Roble, Cedrela for cigar boxes, Palma nigra, black palm for ornamental posts, Quebracho (*Aspidiospermo Quebracho*) resembles our White Oak (*Quercus Alba*) both in-bark and wood.

*Juglans Australis*, their only walnut, approaches our black very much in color and grain.

Quebracho Colorado, another useful one, and also a great tannin producer, nearly 24 per cent., and also as a substitute for *Aspidiosperma*.

Another wood resembling our walnut is the Algarroba (*Prosopis juliflora* and *nigra*) and is actually exported as a substitute for it.

This belongs to order Leguminosæ, as does also *Cæsalpinia melanacarpa*, another walnut substitute.



Zapello (*Pisonia zapello*), Laurel (*Ocotea suaveolens*), Quillaya Tellowiana and *Eugenia pungens* are other important woods, making excellent durable timber.

They took great pride also in their tanning materials, and among the prominent barks and fruits for that purpose were these :

*Acacia angice* and *abramontana*, *Psidium guava*, *Ocotea suaveolens*, or Laurel, *Nectandra posphyne*, Root of mistol, (*Zizyphus Mistol*) Fruit *Cæsalpinia Melanocarpa*, Barks of *Juglans australis* and *Aspidiosperma*, *Croton succirubra*, *Berberis ruscifolia* and *Eugenia Michaela*.

In striking contrast to their woods they showed the following, of which you may know something : Honey Locust (*Robinia Psued-acacia*), Alder (*Alnus ferruginea*) Maple Leaved Negundo (*Negundo Negundo*). Many of our common Beeches and the Weeping Willow (*Salix Babylonica*).

From Europe we had the excellent display of cork and cork tissue ; from Spain, also tans, dyes, licorice, collections of woods including a very complete one from Philippine Islands. Mahogany from Cuba and Porto Rico.

France not only finely illustrated what they were doing to perpetuate Forests by showing us their Reports of Directors and Inspectors of Forestry which were very complete, but showed us many blocks of wood 8 x 12 inches and 22 inches thick with bark removed and surface polished, some dye materials and valuable knobs for veneers, some of which were valued as high as \$1,000 ; also a good collection of seeds and cones. Adjoining France was Siam's exhibit, consisting of 20 or 30 pieces of wood, well polished but not named, a handsome council table of Teak wood attracted considerable attention ; in spite of printed warning "Hands off," hands were "on" entirely too often. The names of vandals have a wider reputation this Columbian year than any previous one.

Some cordage also claimed our attention as composed of the long rattan, they find it much more durable than manilla even for cables. Edible Bird's Nests proved an attraction if not a delicacy.

The series of Ratan Baskets were unique and very artistic ; they were made entirely by convicts, but the prices were most surprising.

The Javanese had similar work and much cheaper.

Germany had no exhibition of woods or so few as not to be noticeable, but showed these fine wood productions, Beer Casks, Barrels, Tubs and Vats, also Cork in its varieties.



The Forest Academy showed the scientific methods of Forest Culture as practised in that country.

Sweden showed Wood Pulp Industry and Cellulose derived from Spruce trees, but no attempt to represent timbers.

Russia's exhibit was characterized by crude and manufactured material from the Linden Bark Fibre (*Tilia Europea*), and comprised nearly everything, from shoes for the sole of the foot, to thatched house to abide in. Shoes, slippers, rough garments, kitchen utensils, and other household articles, matting, brooms, brushes, planking, thatching and many others, which we could not stop to consider, but the whole line was very interesting to every one.

They had also many fine sections of timbers, but no cosmopolitan classification, and we could decipher very little information concerning them.

The Administration of Crown lands gave a finely illustrated idea of timber and its culture, diseases of trees, medicinal plants and roots, gums and resins and Forest management, as also did the Forest Academy of St. Petersburg and the Russian Agriculture, Forestry and Mining Commission.

Japan conferred an honor upon us which I fear was little known, that of being the first country to receive a display of her woods outside of her own, or any attempt to represent them in a foreign land. I have reason to believe that Philadelphia museums will eventually receive the entire Forestry Collection, as their courtesy towards Philadelphia people was decidedly marked, and the least favor more than reciprocated, notably the Secretary of the Commission, Mr. Shikasa Suwa, who took almost a boyish delight in those people who did ask questions and was untiring in his efforts to please them.

The space allotted was entirely too small, and hence crowded inside and out, with scarcely space enough for an aisle.

There were two methods of showing woods, and in both cases were prepared timbers, bark having been removed. One style was a framed collection of the sections about 10 x 14 inches and about 20 or 25 to a frame, the other was by means of unpolished boards, 8 to 10 feet long, and the width of the tree.

Their attempts at labelling were very successful, and beside the technical name, they had the common English name as well as the

Japanese, also the general characters under which the tree existed and flourished, as well as its direct uses to man.

For their lacquer work the principal tree is the Paulownia (*P. Imperialis*), a tree which is adapting itself to our latitudes and proving a fine shade tree.

Another for same purpose is *Zelkova Kaki*, one of the elm family, and still another is a Horse Chestnut (*Æsculus turbinatus*) called by them "Tochi."

Their largest trees are the *Cryptomerias*, a class closely related to our Southern Cypress, often reaching wondrous heights, and are the admiration of all visitors to that Empire.

With that little relation of *Cryptomeria* to Cypress we are able to find some of our genera represented by species close to our own. For that resemblance to relationship we feel very much at home among them, for instance, *Taxus cuspidata*, or yem, *Thuya obtusa* or *Arbor vitæ*, *Æsculus turbinatus* or Horse Chestnut, *Tilia cordata*, or Linden, *Morus alba*, Mulberry, *Juglans Siboldii* and *Regia*, Walnuts, *Acer Japonicum* and *palmatum*, Maples, *Fraxinus pubinervis* or Ash, *Magnolia hypolenca* or *Magnolia*, *Castanea vulgaris*, chestnut, *Alnus firma*, alder, *Betula alnifolia*, Birch, *Quercus acuta*, *gilva* and *glauca* as Oaks, *Diospyros Kaki*, Persimmon, *Pinus Densiflora*, Pine, *Rhus succedaneum* and *vermicifera*, near relative of our *Rhus Tox*.

Paulownia we have established in this country, as also another Japanese, the Gingko (*Salisburia adiantifolia*).

There are also 3 other trees which were represented by sections at the Fair—*Cedrela chinensis*, *Torreya nucifera* and *cinnamomum camphora*.

The Department of Agriculture and Commerce had an exhibition of maps, plans and illustrations of forest growth, woods, plants, wax, resins and wood pulp for paper, bamboo cane and baskets, tanning material, etc. They also had as here represented in the group of the world' in the centre of Forestry Hall 2 bamboos, each over 70 feet long.

India's exhibit consisted of many fine pieces of carved wood, usually teak, timber in the rough as well as fashioned to show to best advantage, specimen tans and dyes, oil-bearing substances, gums, resins and fibres.

We will limit this description to timbers, namely, those yielding drugs of our acquaintance and to the carvings.

The great mantel-piece was compound of Shisham wood (*Dalbergia sisso*), Redwood, Walnut, Boxwood, and some fragments of very old Teak and Blackwood, found in some ruins near Madras and dock excavations in Bombay.

The Teak is about 600 years old and the blackwood dates possibly from before the Christian Era.

The carved doorway of teak wood shown there is of same design and general outline of those used in the thrones of different parts of the Mandalay Palace, but the detail is more elaborate than anything the Palace contains.

The triangular space above the door contains designs intended to represent the City of Mandalay with the King and his courtiers.

The lowest tier shows the city wall, with one of the 7 roofed gateways; on and around this are the guardian "nats" of the city and other mythological figures.

The second tier is supposed to represent the King's ministers and the highest represents the King and his Queens in the palace.

It is executed by a Mandalay carver, under direction of Conservator of Forests, Upper Burmah.

Among the timbers were the following arranged in well-seasoned slabs, bark removed from most of them, and in various sizes and shapes—*Acacia*, *Arabica*, *leucophloea*, *sundra* and *Catechu*.

*Acrocarpus fraxinifolius* used chiefly for tea boxes and shingles.

*Ailanthus excelsa* a soft wood like the *Ailanthus glandulosa* common here. This is used by them for sword handles, spear sheaths and catamarans.

For these boats, however, they use a better wood, *Gynocarpus Jacquain*, so light that its weight is but 20 pounds to the cubic foot.

In heavy contrast to this, however, is the *Hardwickia binata*, which is one of their ornamental timbers, and weighs 82 pounds to the cubic foot.

*Wabo* (*Bamboo gigantea*) is as its specific name implies a gigantic species of Bamboo frequently reaching 125 feet and 25 to 30 inches in circumference and those on exhibition were 64 feet long.

It is chiefly used in light work, scaffolding, etc.

*Bombax malabaricum* is a curious wood which is white when cut but turns dark on exposure, and strange to say is durable only under water.

*Anacardium occidentale*, another member of our Cashew Nut

family, produces a wood moderately hard, used for packing cases, boat building and charcoal.

*Cassia fistula*, very durable but not strong enough for timber.

Satinwood, our hair-brush acquaintance (*Chloroxylon Smietenia*) used for everything from agricultural implements to toilet articles.

Cedar (*Cedrela Toma*) is specially adapted to carving and furniture as it is not susceptible to attacks of white ants.

Ebony (*Diospyros ebenum*) for inlaying, making marked contrast, also valuable for furniture otherwise.

Shisham (*Dalbergia sisso*) is a valuable tree for carving, also the species *latifolia* as well as *Melia Azederach*.

This is held very sacred by the Hindoos and their idols are made from it.

*Cinnamomum glanduliferum* for boat building, etc. *Pterocarpus marsupium* and *Santalinum Strychnos Nux Vomica*, and *potatorum*, all are useful, and Teak (*Tectonia grandis*) is one of their best, for when it is well seasoned it does not crack, warp or split and is not injured by white ants.

*Erythroxylon monogynum* used as a substitute for Sandalwood (*Santal album*) which is highly prized for carvings and incense as well as for perfume.

*Tamarindus indicus* furnishes a rich dark red wood.

Padouk (*Pterocarpus indicus*) is their most valuable tree for construction of furniture, and the Inspector-General of Forests predicts a better future for this than Teak or Mahogany ever had.

Ceylon had no collection of woods in Forestry Hall, but in their Court in Agricultural Building there was quite a fine display which proved uninteresting until the purchase of a Hand-Book of Ceylon Courts, that proved itself the most valuable of its kind, as it treated briefly and pleasantly of the natural history of the island botany, ethnology, language, religion, fibres, etc., agricultural and tea cultivation, besides being valuable for locating the different portions of these exhibits and for describing the different articles on exhibition.

The woods with somewhat familiar names were: *Eugenia bracteata*, *Cassia fistula* and *siamea*, *Melia dubia*, *Diospyros ebenum* and 5 other species, *Mallotus alba*, *Erythroxylon monogynum*, *Pterocarpus marsupium*, *Strychnos Nux Vomica*, *Tamarindus Indica*, *Myristica laurifolia*, *Tectonia grandis*, *Albizzia odoratissima*.

Suringa-mara, one of their hard woods, is used to make pestles and mortars, Sinhalese kind, however. Satinwood (*Chloroxylon Swietenia*) is as abundant and useful here as in India. Another valuable one is the "Nandoon" (*Pericopsis mooniana*) found only in Ceylon.

The Tamarind produces a variegated wood, very ornamental, and but little inferior to Calamander, which is a Persimmon (*Diospyros guesita*) the most attractive cabinet wood in Ceylon.

In this hand-book a chapter is devoted to Native Medicinal Plants and Medicines, and I found it so interesting that I beg to quote a paragraph for the sake of Ceylonese Polypharmacy.

"In most cases the treatment only serves to change an acute disease into one of a chronic character, while recovery from a single affection is protracted, the patient being kept half starved on gruel and made to swallow huge quantities of infusions and decoctions of medicinal herbs villainously compounded, the number of ingredients in each portion increasing in direct ratio with the continuance and severity of the malady."

A mild form of fever, for instance, would be treated with a decoction of the Five Minor Roots—*Desmodium gangaticum*, *Uraria lagopodioides*, *Solanum Jacquini*, *Solanum Indicum* and *Tribulus terrestris*—which are believed to cure fever due to deranged phlegm, catarrh, etc.

A severer form would be ascribed perhaps to deranged air, requiring the use of the Five Major plants—*Ægle marmelos*, *Calosanthus Indica*, *Gmelina arborea*, *Stereospermum suaveolens* and *Premna speciosa*.

In remittent fever, etc., all ten may be prescribed together, and in typhoid fever, with head symptoms, all these with eight or ten others.

Many articles of their Pharmacopœia were on exhibition, some not unknown to ours. The display of *Cinchona* Barks and *Cinnamons* were very fine.

The exhibit of New South Wales was the only one in Forestry from Australia, and a glance at it showed the excellent judgment of the Commission in selecting those timbers which are most useful in their Industrial Arts, for their original intention was to show some 19 classes relating to forests and prepared woods, but there were but 6 on exhibition.



Two of the small ones will be considered now and the third later on.

Under Class of Dyes and Tans, there were 3 large collections and strange to say all the Tans were from genus *Acacia*, two (2) of Wattle Bark (*Acacia decurrens*) and one (1) of Hickory (*Acacia penninervis*).

The Wattle of Raymond & Co. analyzed 35.75 per cent. Tannin and 39.5 per cent. extract.

The space allotted Australia was neatly enclosed by a sort of stockade effect in planks, nine (9) feet high and two (2) to three (3) feet wide, polished to half their length or more and labelled in vernacular. The classes of Logs, worked Timber, and ornamental Woods, will be considered together, as the best work of the Director-General of Forestry was with these three (3) classes.

They consisted of various sized specimens sufficient to show best characters of them from the boards forming the outer wall of the exhibit, to herbarium size of wood and bark, 12 x 18 in. Chief of the large timbers were the Mangrove (*Avicennia officinalis*), Swamp Oak (*Casuarina glauca*), Forest Oak (*Casuarina torulosa*), Red Cedar (*Cedrela australis*), Rose Wood (*Dysoxylon Fraserianum*), and 9 species of *Eucalyptus*, *E. botryoides*, Bastard Mahogany, *E. crebra*, Gray Iron Bark; *E. longifolia*, Woolly-butt; *E. macrorrhyncha*, stringy-bark; *E. microcorys*, Tallowood; *E. pilularis*, Black butt; *E. paniculata*; She or Pale Iron Bark; *E. populifolia*, Red box, and *E. resinifera*, Forest Mahogany.

Also these indigenous trees, nine (9) species of *Acacia* of which *decurrens* is the most valuable for tanning purposes, as it yields from 25 to 35 per cent. tannin and is known there as Green Wattle.

*Acacia peuneri* known as Hickory, and *Acacia salicina* as native willow, Apple Tree, *angophora intermedia*, Black Oak as *casuarina suberosa*, Sycamore, *Cryptocorya obovata*, Sassafras, *Doryphora sassafras*, White Tea Tree *Melaleuca leucadendron*, and 18 species *Eucalyptus*.

Of the Herbarium sizes there were 105, showing bark on one side and wood on the other, and included 17 species *Acacia*, 5 *Casuarina* or so-called oaks, 19 *Eucalyptus*, 6 *Melaleuca* and the remainder in genera not specially interesting.

Eighty (80) species, showing Seeds and Seed vessels from the following and others: 10 *Acacias*, 5 *Casuarinas* and 26 *Eucalyptus*, 107 Barks, principally *Acacias* and *Eucalyptus*, 27 of the latter were noted and 5 of former, *Mallotus philippinensis*, *Duboisia myopo-*



roides, etc. These were about 12 x 18 in., and banded by a thin strip of metal and suspended, when they formed a most pleasing part of this exhibition and the 27 Eucalyptus were the most interesting of the section. For outside the interest with which we consider them in *Materia Medica*, they are a wonderful class to all who stop long enough to compare one species with another, as for instance, the great variation in the bark is of itself startling; there are all gradations from the smoothest to the roughest and most deeply fissured we have in any tree, all to be found in this one genus *Eucalyptus*, and as strange as the barks were startling, are some of the vernacular names applied to these trees.

Besides those mentioned previously are such as these: Yellow Box, Swamp Mahogany, Blue Gum, Spotted Gum, White Box Bloodwood and Peppermint; consequently they specify this as pipetta.

The commission showed also in another class photographs of their typical trees.

Woolly Butt (*Eucalyptus longifolia*), 230 feet high and 33 feet circumference.

Black Butt (*Eucalyptus pilularis*), 280 feet high and 59 feet circumference.

Spotted Gum (*Eucalyptus maculata*), 300 feet high and 18 in circumference.

Native Fig (*Ficus macrophylla*), 250 feet high and 36 feet circumference.

River Oak (*Casuarina glauca*), 120 feet high and 16 in circumference.

Turpentine (*Syncarpia laurifolia*), 200 feet high and 30 feet circumference.

In conclusion, I might say that there are about 50 species of *Eucalyptus*, in Australia, and all useful in some way or other, but chiefly in those cases when strength and durability are desired. They resist both fire and water, therefore very little in demand for fuel.

These also rank as the highest trees of the world, as the species *Amygdalina* was found with a diameter of 81 feet and a height of 480 feet, and according to some authorities this is 150 feet higher than the Sequoias of California.

So at this nearly antipodal pinnacle or tree-top, I will leave you to draw your own conclusions, whether or not this World's Columbian Exposition was the most colossal of its kind, and its Forestry feature a pronounced success?

## A METHOD FOR ASSAYING VINEGAR OF OPIUM.

BY LYMAN F. KEBLER, PH.C.

Having prepared a sample of vinegar of opium according to the directions of the United States Pharmacopœia of 1890, I was desirous of estimating the per cent. of morphine it contained. Turning to this authority for instructions, I found the following: "To assay this preparation, transfer 100 cc. of it to a small capsule, add 4 gm. of precipitated calcium carbonate, or such a quantity as will neutralize the free acid, and then proceed further as directed under *Tinctura Opi.*"

It is unnecessary here to go into details concerning the method; suffice it to say that the final evaporation is continued until the extract weighs 14 grams.

According to the process of manufacture and final preparation for assay each 100 cubic centimeters contains 20 grams of sugar, about 8 grams of calcium acetate and, making a conservative estimate that the menstruum will extract 50 per cent. of the opium, or 5 grams, giving us a total of at least 33 grams of solids. In fact, when 100 cubic centimeters are evaporated to 50 grams the residue becomes nearly solid. Is the method practical or even possible of execution as it stands?

I have devised a method which has given me very encouraging results, although it has not been applied very extensively. In triple assays of the same sample the following results were secured: 1.220 per cent., 1.237 per cent., 1.213 per cent.

The method is as follows: 100 cubic centimeters of the vinegar of opium are rendered alkaline with strong ammonia water (8-10 cubic centimeters) intimately mixed, 2 cubic centimeters of ether added, to prevent frothing, vigorously shaken for 10 minutes and set aside for 6 hours or overnight. After the alkaloids are completely precipitated, pass through a filter previously wetted with water and wash the precipitate sparingly. While the precipitate is yet decidedly moist transfer it into a small capsule by means of a wash bottle, using as little water as possible. To the contents of the capsule add 10 cubic centimeters of 5 per cent. sulphuric acid or enough to render acid, warm on the water-bath, cool, allow to stand one hour or more, filter and wash the filter and residue well with distilled water. The exact process of the Pharmacopœia can be

followed from here if desired, or evaporate in a tared capsule to 14 grams and proceed from this point as directed in the Pharmacopœia of 1890 from a corresponding point.

It is very desirable, if not necessary, to investigate the purity of the morphine by means of the lime water test.

As a check to the gravimetric method it is recommended to triturate the morphine with a volumetric acid solution.

LABORATORY SMITH, KLINE & FRENCH CO.

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### PHARMACAL PREROGATIVE.

BY WILLIAM B. THOMPSON.

The French pharmacal authorities appear to exercise a more liberal view of the prerogatives of the pharmacist than is accorded in America. The commission to whom is entrusted the additions to, or the revision of, the French Codex had under consideration the preparation of a table of maximum doses of the habitually prescribed medicines for the use of apothecaries. The limitations of this table were never to be exceeded except upon the written order of a doctor. A purpose like this bears upon its face a recognition of the fact that the science of dosage is not only an essential part of the general or complete education of the pharmacist, but that under certain proper conditions he may exercise this knowledge for the benefit (?) of those patrons who are willing to prescribe for themselves, as it were. This does not necessarily involve the function of diagnosis, and should not be implicated with it, but it simply induces the apothecary to invest himself with the knowledge requisite for the exercise, and also gives him an official sanction. We all know that among American pharmacists a disposition to instruct in regard to dose, and other uses of medicine; in other words, to enter the domain of applied medicine, has resulted in straining somewhat the ethical relation with the physician and provoked retaliatory measure. Through this both have suffered, and a breach been created. It is safe, as well as true, to say that in leading or representative pharmacies there is a studied avoidance of what may be deemed to be prescribing, but on the other hand let me ask what would be the measure of estimation in which the knowledge of the pharmacist would be held if he should be compelled to avow an ignorance on

the subject of dosage? Yet, how can he apportion dose without being made aware, to some extent at least, of the conditions requiring it. Thus one degree of knowledge, merging as it were by a natural connection into another, has probably proved to be the step which has served unintentionally to connect the two functions of diagnosing and prescribing, and involved the apothecary, for it is well known by experience and observation that the public are apt at first to resort to the advice of the druggist, and only to the doctor when a final resort becomes necessary.

Subjects like this which we have introduced here, and which involve the relations and offices of the respective spheres of pharmacy and medicine, also involve a principle which should lead to some settlement or adjustment. Liberal and generous minds only can do this. The busy man seldom stops to complain of the innovations of a competitor and rival. Who complains is generally he who has leisure to nurse grievance, and become morbidly sensitive. An active mind will find self-defence in devising ways and means to equalize disadvantages. All fair minds certainly have an ill-concealed contempt for those in either domain—pharmacy or medicine, who assert prerogatives, and assume responsibilities which, did they not menace health and life, would simply be a ridiculous pretension.

*Philadelphia, February 20, 1894.*

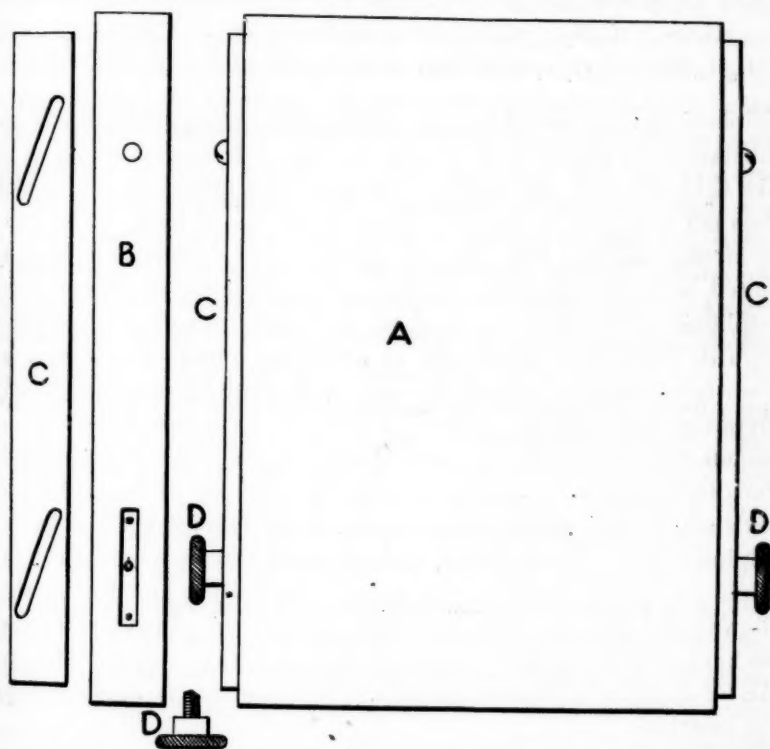
## NEW LOZENGE APPARATUS.

BY WALLACE PROCTER, PH.G.

The annoyance experienced in dispensing lozenges has been long recognized by the practical pharmacist, but has never been obviated as it should be, and to accomplish this in an easy and inexpensive manner, the apparatus here exhibited is offered to the attention of the meeting.

The board is made preferably of a piece of well-seasoned hard wood, one and a half inches thick, ten inches wide and fourteen long, planed perfectly flat, and both sides and ends made square and true—at each side about three inches from one end a plate is let in flush, and tapped with a screw; on each side a plate of brass one and a half inches wide, fourteen long, and three-sixteenths of an inch thick is fitted; each plate has two slots, crossing the plate diagonally, three-eighths of an inch from each edge; these slots must have exactly the same slope, and through one slot of each

plate a square-shouldered screw passes and is screwed in until it presses the plate close to the side of the board, but still permits it to move easily; through the other slot in each plate a set screw passes and enters the screw plate before mentioned; when the plates have been adjusted to a given height, the set screws are turned until they prevent any motion of the plate. After the lozenge mass has been prepared it is weighed and the weight is then divided by the number of lozenges ordered; the mass is made of the thickness thought



to be right by the operator, the cutter applied, and, if the weight agrees with that ascertained by dividing the entire quantity, the work proceeds at once, but if too heavy the guides are lowered, or if too light they are raised until the proper weight is attained.

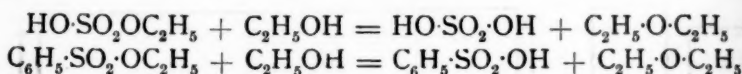
The cut illustrates the apparatus very fully. *A* is the board, seen from above. *B* is a side view. *C C* slides in place. *C* a slide detached to show the slots, the front one should be ruled to divisions of the 32d of an inch. *D* the set screws, one in place and the other detached.



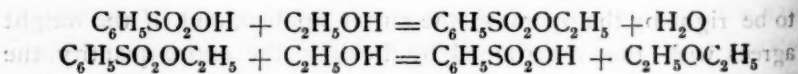
## GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, PH.G.

*The manufacture of ethyl ether* and its homologues by the intervention of aromatic sulphonic acids and based upon extensive research is announced by Professor Krafft. The alkyl esters of sulphonic acid, like the alkyl sulphuric acids, possess the property of forming ethers when heated with alcohols; these reactions are expressed as follows:



Sulphuric acid, as is well known, readily gives up oxygen to oxidizable substances, to which class alcohol belongs. In the sulphonic acids like  $\text{C}_6\text{H}_5\cdot\text{SO}_2\cdot\text{OH}$  the hydroxyl group of the sulphuric acid, which does not take part in the etherification of the alcohol, is replaced by strong radicals like phenyl, naphthyl, etc., which are strongly united with the sulphonic group, in consequence of which these sulphonic acids show a marked stability towards the alcohols towards which they do not act as oxidizing agents but simply as etherifying agents. Sulphuric acid upon heating only reluctantly gives up water and the gradual taking up of more water in the manufacture of ether finally prevents the etherification of the alcohol; the disadvantage is notably reduced by the use of the sulphonic acids which give up the water much more readily than does the sulphuric acid. In the preparation of ether and its homologues the sulphonic acid is heated to the proper temperature and the alcohol allowed to run in; the distillate consists of ether, water and unchanged alcohol; the sulphonic acid is always regenerated and can be used for unlimited periods. The process is illustrated by the reactions:



Experiments have proven that benzene-sulphonic, benzene-disulphonic, *p*-toluene-sulphonic,  $\beta$ -naphthalene sulphonic acids or their esters are suitable for the manufacture of ethers. Benzene sulphonic acid has, without loss of its activity, been used in converting one hundred times its weight of alcohol into ether; under favorable



conditions several thousand times its weight alcohol can be converted into ether. This process, the most continuous of all artificial processes, has another advantage in its practical application, namely, the purity of the products.—(Berichte d. d. Chem. Ges.) Chemiker Ztg., 1893, 1876.

*Picramnia camboita*, Engl.—The crystallizable fat, isolated from the fruit, is the glyceride of an unsaturated fatty acid,  $C_{18}H_{32}O_2$ . See Am. Journ. Pharm., 1893, 379. The same acid, an isomer of stearolic acid, has recently been isolated by A. Arnaud in the seeds of *Picramnia Sow* or *tariri* (Aublet) and called by him *tariric acid*.—Dr. B. Grützner, Chemiker Ztg., 1893, 1850.

*Test for glucose in urine*.—Small strips of a pure woollen fabric are impregnated with an aqueous ten per cent. solution of stannous chloride and dried at a moderate temperature. If a few drops of the urine be placed upon such a prepared fabric and dried at a moderate temperature, or even over a burner, a dark coloration reveals the presence of glucose; by comparison with the colorations produced with glucose solutions of definite strengths approximately quantitative glucose determinations can be quickly made.—Bruno Bizzari (Gazz. d. Farm.) Pharm. Post, 1894, 35.

*Chloral alcoholate in chloral hydrate* can be detected by warming 1 gr. of chloral hydrate with 1 cc. nitric acid (specific gravity 1.38); pure chloral hydrate will give a colorless mixture; 10–20 per cent. alcoholate in the hydrate produces a yellow coloration, without the application of heat, in from 3–5 minutes; upon heating the color appears after a few seconds; 5 per cent. alcoholate will not give the reaction in the cold but immediately upon warming; 1 per cent. alcoholate, after 3–4 minutes' heating, develops the color followed after about ten minutes by the evolution of yellow fumes. The test for alcoholate may be formulated as follows: One gram of the chloral hydrate covered with 1 cc. nitric acid (sp. gr. 1.38) should not, at ordinary temperature or after warming, produce a yellow colored mixture or emit yellow vapors.—E. Hirschsohn, Pharm. Ztschr., F. Russl., 1893, 817.

*In the estimation of glycerin in fluid extracts* the published methods for estimating glycerin are not suitable, owing to certain plant constituents being extracted and weighed along with the glycerin. Dr. O. Linde publishes the following method, which has proven to give fair results (a loss of 5 or 6 per cent. by evaporation is not to

be avoided) with the fluid extracts of frangula, hydrastis, cascara sagrada and ergot, while the fluid extract of condurango, however, always gave high results, caused by the solubility of one or more of the constituents in water and ether-alcohol; 10 gms. of the fluid extract are evaporated to 5 gms., the residue dissolved in 50 cc. water and solution of lead subacetate added drop by drop until the precipitation is complete; the precipitate is allowed to subside when the clear liquid is filtered through a water-wetted filter and then the precipitate transferred and washed with water; the filtrate is acidified with a few drops of diluted sulphuric acid, a concentrated solution of phospho-tungstic acid added until precipitation ceases and the mixture filtered and washed as before; the filtrate is now made alkaline with dilute solution of sodium hydrate, evaporated to syrupy consistency, 30 cc. of a mixture of equal volumes of absolute alcohol and ether added, the mixture filtered and the insoluble matter washed with ether-alcohol; the ether-alcohol solution is evaporated in a tared flask, having a long neck, and dried to constant weight. The residue is almost pure glycerin contaminated generally with but a little coloring matter.—Pharm. Centrahalle, 1894, 39.

*Pomegranate alkaloids.*—Ciamician and Silber find that the pseudo-pelletierine of Tanret is a tertiary base, in all probability belonging to the class of keton-amines; the products of its reduction are perfectly analogous with those of tropine. The authors propose to change the name "pseudo pelletierine" into "granatonin," to indicate its character as a keton-amine.—(Berichte) Apotheker Ztg., 1893, 625.

*Capsicum.*—Capsaicin exists not alone in the placenta, but also in the outer red integuments; these if very carefully and perfectly freed from the inner membranes are found to possess a very pronounced sharp taste. The following percentages of ether extract were obtained: Outer red coating, 5.96-6.76 per cent.; entire fruit, 8.4-9.26 per cent.; inner coating, 6.02-6.50 per cent., and seeds, 14.20-14.36 per cent. The above statement corrects one made by A. Meyer (Am. Jour. Phar., 92, 100), that the sharp principle was only present in the placenta.—V. Vedrödi (Ztschr. f. Nahrungsm. Unters.) Apotheker Ztg., 1893, 626.

*The cochineal coloring principle*, recently examined by W. von Miller and G. Rohde again establishes its non-glucosidal nature.

The usual statement that carminic acid is a glucoside decomposing into glucose and carmine-red is proven to be a false one, and the identity of carmine-red and carminic acid is announced; after boiling carminic acid with dilute sulphuric acid for some hours, unchanged carminic acid and a strong reducing substance of unknown composition can be separated, the latter no doubt has been looked upon as a sugar; formic acid was also produced in this decomposition.—(Berichte) Apotheker Ztg., 1893, 638.

*Bulgarian rose oil.*—The chief constituent of the elaeopten is roseol, a primary alcohol of the formula  $C_{10}H_{20}O$  belonging to the olefine series; its acetate  $C_{10}H_{19}C_2H_3O_2$  is a colorless liquid of a different and more agreeable odor than that of oil of rose. The stearopten which, after purification, forms odorless, white crystallized plates, has the formula  $C_{16}H_{34}$ , melts at  $36.5-38^\circ C.$ , congeals at  $34^\circ$  and boils at  $350-380^\circ C.$ —W. Markownikoff and A. Reformatsky (Journ. f. prakt. Chem.) Apotheker Ztg., 1893, 638.

*Cane sugar* was identified as one of the constituents of the root of *Scopolia corniolic*; the melting point of the crystals  $183^\circ C.$  differing from the melting point of the cane sugar as usually accepted ( $160^\circ$ ) led to an examination of the literature on the subject: Berzelius states  $160^\circ C.$ , Peligot  $180^\circ C.$  and E. Merck  $163^\circ$  to  $164^\circ$  (from *ipecacuanha*). A determination of the melting point of pure cane sugar recrystallized from alcohol, gave by the same method of determination  $183^\circ C.$ —Prof. E. Schmidt, Apotheker Ztg., 1894, 6.

*White ipecac* has been found by A. André in a recent shipment of senega; the former drug containing emetine, attention is directed to this, no doubt accidental, admixture. The sample itself, probably, was obtained from a polygala variety growing in a section of the country along with white ipecac; the senega, which did not uniformly show the characteristic keel, had long, bright violet-colored stem remnants attached.—Apotheker Ztg., 1894, 23.

*The manufacture of salol* by a recent German patent depends upon the formation of salicylide ( $C_7H_4O_2$ )<sub>4</sub> and polysalicylide ( $C_7H_4O_2$ )<sub>n</sub> by the action of phosphorus oxychloride upon solutions of salicylic acid in indifferent solvents like toluol, etc.; polysalicylide and phenol heated to a temperature of  $210-220^\circ C.$  (best under pressure) react together forming salol, which is afterwards separated by fractional distillation and purified by recrystallization.—Apotheker Ztg., 1894, 40.

*Ozone formation at high temperatures.* The usual method of making oxygen by heating potassium chlorate and manganese dioxide gives a gas having a strong chlorine-like odor, and the statement is frequently made that chlorine is present in the oxygen produced in this way; this odor which could not be due to mere traces of chlorine, led Brunck to make an investigation. The residue, obtained by heating potassium chlorate and manganese dioxide, with water gave a clear and neutral solution (demonstrating that chlorine could not have been liberated as in that case an alkali would either result or some manganese would enter solution as a manganate); the gas after washing with strong potassium hydrate solution not losing its property of bluing potassium-iodide-starch test paper first suggested the presence of ozone which would explain the odor and behavior. It was then demonstrated that ozone was not decomposed at the temperature at which the gas is made and that it could even exist at a red heat if it was not kept at that temperature too long. Perfectly pure potassium chlorate, if heated by itself, will yield a perfectly pure oxygen, but even traces of potassium chloride, silica, etc., are sufficient to cause the formation of ozone; equal quantities of black oxide of manganese and very carefully purified potassium chlorate gave off oxygen containing 0.3 per cent. ozone; the ozone increases with larger quantities of the black oxide, when the proportions are 25 to 1, the oxygen contains 1.55 per cent. ozone. A study of the metallic oxides in connection with this ozone formation showed that the oxides of silver and mercury and peroxides of lead and barium even if heated in atmosphere free from oxygen will yield ozone; other oxides like those of manganese, cobalt and nickel heated in an atmosphere free from oxygen will yield no ozone but will do so if heated in a current of oxygen or if heated with some oxygen liberating substance like potassium chlorate. A remarkable effect is exerted by the alkalis; if small quantities of sodium carbonate, etc., be added to the manganese dioxide and potassium chlorate no ozone is produced; the residue, however, then contains sodium peroxide; if the black oxide of this last experiment be thoroughly washed and used again with potassium chlorate it will not have lost its property of forming ozone.—(Berichte) Apotheker Ztg., 1894, 41.

*Lycetol, lupetazine, dimethyl-piperazine and dipropylene-diamide* are all names given to possible substitute for piperazine; this base is a

liquid and has the formula  $(C_3H_6)_2(NH)_2$ ; it is introduced as the tartrate and pronounced to have at least the same power of dissolving uric acid as is possessed by piperazine; the organic acid is claimed as an advantage as this being converted into the carbonate has a tendency to render the blood alkaline.—*Apotheker Ztg.*, 1894, 76.

*Tricresol*.—A purified mixture of the cresols present in coal tar, soluble in water to the extent of 2.2–2.5 per cent., specific gravity 1.042–1.049 at 20° C.; boiling point, 183–202° C., perfectly soluble in dilute alkali.—*Pharm. Ztg.*, 1893, 751.

*Ferratin*.—An artificial iron-albumen food is made from egg-albumen and an iron salt in the presence of an alkali; it contains seven per cent. iron; it is a red-brown powder almost odorless and tasteless; dose for adults 0.5 gm. three to four times daily.—*Pharm. Ztg.*, 1893, 762.

*Neurodin* or acetyl-*p*-oxyphenyl ethyl carbamate  $C_6H_4(OCOCH_3)(NHCOOC_2H_5)$  and *Thermodin* or acetyl-*p*-ethoxy phenyl-ethyl carbamate  $C_6H_4(OC_2H_5)N(COCH_3)(COOC_2H_5)$  are colorless crystallizable substances, almost insoluble in water and melting at about 87° C.; the former is used especially as an antineuralgic in doses of 0.5–1.5 gm. the latter is used as an antipyretic in doses of 0.5–0.7 gm.—*Pharm. Ztg.*, 1893, 785.

*Mercurial ointment*.—Anhydrous wool-fat forms a splendid basis for extinguishing mercury; it is possible to extinguish 1,000 gms. mercury with 200 gms. anhydrous wool-fat.—*E. Buch, Pharm. Ztg.*, 1894, 40.

*Basic bismuth salicylate*.—Crystallized bismuth nitrate (486 gm.) is dissolved in about four times its weight of dilute acetic acid, diluted with about forty times its weight of water and precipitated with ammonia; the precipitated hydrate is washed by decantation until the test for nitric acid becomes negative, then transferred to a capsule and heated on a water-bath with salicylic acid (138 gm.) when a magma of crystals, having the formula  $BiOC_7H_5O_3$  when dried at 70–75° C. results. Cold water will not decompose the salt so that no reaction with litmus paper or ferric chloride is obtainable; strong alcohol and boiling water will dissolve small quantities of the salt, the solution giving test for bismuth and salicylic acid. All attempts to produce salts of different composition by this method gave negative results.

*Bismuth subgallate* can be made by the same method, using 10



gm. crystallized bismuth nitrate and 3.5 gm. gallic acid; the product has a lemon-yellow color, is free from nitrates and other impurities, and is soluble without residue in sodium hydrate solution; free gallic acid cannot be detected by treatment with alcohol or nitrate by extracting with boiling water; the formula is  $\text{Bi}(\text{OH})_3$ ,  $\text{C}_7\text{H}_5\text{O}_5$ , when dried at  $60\text{--}70^\circ \text{C}$ .—B. Fischer and B. Grützner, *Arch. der Pharm.*, 1893, 680 and 685.

### ARSENIC IN GLYCERIN.<sup>1</sup>

BY DR. B. H. PAUL AND A. J. COWNLEY.

The presence of arsenic in glycerin has been on several occasions a source of alarm, and the probability that the method of manufacture adopted in the production of glycerin may in some instance give rise to impregnation with more or less arsenic is sufficient to give importance to the subject. Quite recently it has been stated by Mr. Fairley, the public analyst for Leeds, that he has found appreciable amounts of arsenic in the glycerin of commerce. We have, therefore, obtained several samples of glycerin and examined them for arsenic, with the results stated in the accompanying table:

Sample Number.	Result of test applied to the Glycerin (1 cc.) direct.	Result of Test applied after destroying Sulphur compounds by Iodine.	Fraction of a milligramme of Metallic Arsenic in 1 cc. of Glycerin.
1	Stain in 10 mins.	Stain as before.	
2	Stain in 16 hours.	Stain as before.	'01
3	Stain in 16 hours.	No stain in 16 hours.	—
4	No stain in 16 hours.		—
5	Slight stain in 16 hours.	No stain in 16 hours.	—
6	Slight stain in $1\frac{1}{2}$ hours.	Slight stain in 16 hours.	'001
7	Slight stain in $1\frac{1}{2}$ hours.	Slight stain in 16 hours.	'001
8	Stain in 30 mins.	Stain as before.	'01

The samples examined were less numerous than we intended, owing to some promised supplies not having been received, but those above referred to represent the produce of several makers, and it will be seen that, with the exception of No. 1, the amount of arsenic was never sufficient to be a cause of apprehension, while in three of the eight samples there was no indication of the presence

<sup>1</sup> *Phar. Jour. Trans.*, Feb. 24, 1894.

of arsenic. The sample No. 1 was of a character not likely to be met with in ordinary retail trade, being, in fact, the crude material used in the manufacture of nitroglycerin. The largest quantity found in samples Nos. 2 and 8 amounted to only one grain of metallic arsenic in fourteen pounds of glycerin.

It appears, therefore, that with the exercise of due care in applying the test above described, there is really no difficulty in obtaining glycerin practically free from dangerous contamination with arsenic. But it is desirable that this point should be determined by applying the test in all cases.

The ordinary form of Marsh's test is inapplicable for the detection of minute quantities of arsenic, and with all but one of the samples examined we failed to obtain satisfactory indications of the presence of arsenic in the glycerin, which was subsequently found to contain it.

The method of testing employed for this purpose was a modification of that introduced by Gutzeit, which consists in allowing the gas slowly evolved from sulphuric acid and zinc, in contact with the liquid supposed to contain arsenic, to act upon filter paper moistened with a saturated solution of argentic nitrate and placed over the mouth of the test tube in which the reaction takes place. If arsenic is present, arseniatted hydrogen is formed, and a yellow stain is produced upon the filter paper. For application to glycerin this test has been modified by Vulpius, Flückiger and Siebold. Hydrochloric acid is substituted in place of sulphuric, and mercuric chloride is used instead of argentic nitrate. A mixture of two cubic centimetres of the glycerin to be tested with 5 cc. of hydrochloric acid (1 to 7) and 1 gramme of pure zinc is placed in a long test tube, the mouth of which is covered with a disc of filter paper previously moistened with one or two drops of mercuric chloride solution and then dried. If arsenic be present in any considerable amount a yellow stain is produced upon the filter paper after a few minutes, and it subsequently becomes darker. When the amount of arsenic is very minute it is necessary to allow the action to continue for a longer time. Fifteen minutes is considered by Mr. Siebold sufficient for practical purposes, and if no stain is produced in that time the glycerin may be regarded as free from arsenic. But though extremely small quantities, such as  $\frac{1}{100}$  or  $\frac{1}{1000}$  of a milligramme of arsenic, are indicated by this test, we think it is preferable to allow a longer time to elapse in testing.

If the samples examined can be taken as similar to the glycerin generally met with, it would appear that in regard to the amount of arsenic there has been a great improvement since 1890, when Mr. Siebold's paper was published. He then found 1 part in 6,000 or 4,000, and even more, whereas the arsenic in samples Nos. 2 and 8 amounts to only one part in one hundred thousand, and that in the samples Nos. 6 and 7 to only one part in a million.

The circumstance that zinc frequently contains a trace of sulphur which would be eliminated, by the action of acid, in the state of sulphuretted hydrogen, may exercise a disturbing influence in the application of the test. In such a case the quantity of sulphuretted hydrogen will generally be so small that it does not produce a black spot on the filter paper impregnated with mercuric chloride, but a spot having almost the same color as that produced by arseniatted hydrogen. In this way a sample of glycerin that is perfectly free from arsenic may appear to be contaminated.

For this reason it is always advisable to repeat the experiment, adding to the mixture before the zinc is put in, some starch mucilage and a small quantity of iodine solution until a blue tinge is produced. In this way the formation of sulphuretted hydrogen is counteracted. Mr. Siebold<sup>1</sup> has, however, pointed out that the use of iodine for this purpose requires caution, for if too much iodine is added for the destruction of sulphur compounds it interferes with the reaction, and may lead to erroneous conclusions.

In every instance it is, of course, desirable in testing glycerin for arsenic to make a blank experiment, so as to be absolutely certain that neither the hydrochloric acid nor the zinc employed contains any trace of arsenic.

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## ACTION OF SULPHURIC ACID UPON WOOD-CHARCOAL.<sup>2</sup>

By A. VERNEUIL.

The secondary reactions which accompany the formation of sulphurous and carbonic anhydrides in the reaction of sulphuric acid

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<sup>1</sup> *Pharm. Journ.*, [3], xx, p. 682.

<sup>2</sup> *Comptes Rendus*, 118, 195, through Chemical News.

upon wood-charcoal do not appear to have been hitherto the object of any study.<sup>1</sup>

The black, viscid and non-crystalline product which forms the residue of this operation contains several interesting substances, among which I have already been able to extract, in considerable quantities, two of the principal benzene-carbonic acids, mellic acid (pheno-hexamethyloic acid) and benzene-pentacarboxylic acid (pheno-pentamethyloic acid). Their preparation and identification form the object of this memoir.

(1) The formation of these acids seems to me principally connected with the great concentration of the sulphuric acid, and consequently with the temperature of the reaction. Hence it is suitable to effect a rapid escape of the gases to prevent, as far as possible, the reflux into the flask of the water produced during the reaction.

On account of the impurities of charcoal (water, ash, etc.), and to avoid the destruction of the products first formed, by a large excess of sulphuric acid, I used in my first experiments only 1,400 grms. ordinary acid to 100 grms. charcoal.

A thermometer immersed in the liquid shows that the reaction reaches its full intensity about 280°. The temperature rises to 300° only at the end of the operation. The flask is weighed from time to time, and when it only contains from 90 to 100 grms. of matter, which ensues after heating for about six hours, the process is terminated. It is difficult to exceed these limits without the risk of burning the product. The quantity of organic matter which is carried away with the water and the sulphuric and sulphurous acids which distil over is unimportant. When cold the mass is taken up with water which becomes charged with substances of a deep brown color, and leaves a black insoluble matter undissolved, in which no trace of the original charcoal can be recognized. This product, which is soluble in alkalis and in concentrated sulphuric acid, will be the subject of future study.

The sulphuric acid contained in the liquid is eliminated by means of barium chloride, avoiding excess. The clear decanted liquid is then evaporated to dryness. There remains a brown amorphous substance, very acid, the weight of which is about one-fifth of the

<sup>1</sup> M. Terreil has certainly indicated the formation of a small quantity of an organic acid which sublimes during the preparation of sulphurous acid gas by this process (*Bull. Soc. Chimique*, 2d Series, Vol. II, p. 413).

charcoal originally used. This acid mixture is taken up in water and saturated with ammonia, which precipitates the oxides of iron and manganese, the lime, etc., in the state of basic salts. The filtrate, on strong concentration, deposits crystals of ammonium mellate, which are obtained perfectly pure on three or four recrystallizations from  $1\frac{1}{2}$  parts of water. The yield is about 4 per cent. of the weight of charcoal originally taken.

This ammonium mellate is characterized by its crystalline form, which, according to Wyruboff, is that of an orthorhombic prism, with mm. =  $114^{\circ} 25'$ ,  $a'p = 151^{\circ}$ ,  $e'p = 160^{\circ} 5'$  similar to that described by G. Rose.

The determination of the ammonia, calculated as  $\text{NH}_4$ , gives 17.39 per cent. Theory for  $\text{C}_8(\text{CO}_2)_6(\text{NH}_4)_6\text{H}_2\text{O}$ , requires 17.82 per cent.

With barium chloride it gives in a dilute solution a white amorphous precipitate, which is quickly transformed into a mass of fine characteristic needles which after desiccation over sulphuric acid correspond to the formula  $\text{C}_{12}\text{O}_{12}\text{Ba}_3\text{H}_2\text{O}$ .

I have found that this ammonium mellate is transformed at  $160^{\circ}$  into euchroic acid, which, on a zinc plate, gives the fine characteristic blue color, turning crimson, on treatment with alkalis (Woehler).

These facts prove that one of the acids produced in the oxidation of charcoal by means of sulphuric acid is mellic acid.

(2) I have not found a simple and rapid method for purifying the salts which remain in the brown aqueous solution separated from the crude mellate. The process which I have adopted consists in transforming these ammonium salts into barium salts, in dissolving the latter into hydrochloric acid, then in fractionating the baryta. The brown substances which contaminate these products are thus entirely removed.

To this end the solution of the ammonium salts is evaporated to dryness in presence of a slight excess of barium hydroxide. The basic salts obtained are then dissolved in the cold in  $\text{HCl}$  diluted with ten parts of water. To this liquid is added a hot concentrated solution of baryta until the formation of a permanent precipitate. After this the precipitation is fractionated by adding to the liquid a solution of 30 grms. barium hydroxide per kilo of charcoal used.

The first precipitate, separated the next day from the supernatant



liquid, carries down with it the chief part of the brown products. On continuing this fractionation until the liquid becomes alkaline, we obtain five precipitates less and less deeply colored. The two first are crystalline, the three latter gelatinous.

Leaving for the present the three last amorphous precipitates, as well as the barium salt which remains in solution in the ultimate alkaline liquid, I will merely now examine the two crystalline precipitates, which are similar enough to be united together.

They give, in dilute HCl, a brown solution, which on concentration deposits an acid barium salt crystallized in needles mixed with barium chloride. These two salts are easily separated from the brown products, and they are obtained quite white after three or four recrystallizations in dilute HCl. They are then decomposed by equivalent quantity of sulphuric acid. The barium sulphate is filtered off, the liquid evaporated to dryness to expel hydrochloric acid, and the residue, on a final crystallization from water, yields pure pheno-pentamethyloic acid. The yield is three per cent. of the weight of the charcoal used. This acid, first obtained by Friedel in 1880, by oxidizing pentamethylbenzene by means of potassium permanganate is very soluble in hot water, from which it is deposited in fine silky needles. It is soluble in alcohol and ether; it effloresces in the air, and loses 27.56 per cent. of water over sulphuric acid. The quantity of water calculated for  $C_6H(CO_2H)_5 \cdot 6H_2O$  reaches 26.60 per cent.

If dried at  $110^\circ$  it agrees with the formula  $C_6H(CO_2H)_5$ . On saturation with ammonia it precipitates barium chloride; like the corresponding mellate, the amorphous precipitate is not spontaneously converted into crystals. Its alkaline salts give, with silver nitrate, a precipitate which on desiccation contains 64.38 per cent. of silver. This salt deflagrates if heated, yielding a black voluminous pulverulent matter, which on roasting leaves a mass of pure silver.

This acid requires for saturation 93.46 per cent. KOH. These data suffice to characterize pheno-pentamethyloic acid.

To complete this investigation it remains for me to purify the fractionation baryta products, which I have not yet been able to examine, and to determine if the acids just described are really derived from carbon, or if they are merely the results of hydrogen products which an incomplete calcination always leaves in wood-charcoal.

## MINUTES OF SPECIAL MEETING OF THE COLLEGE.

FEBRUARY 16, 1894.

In conformity with notice duly given, a special meeting of members of the College was held this day at 11 o'clock, A.M. Charles Bullock presided, and twenty-seven members were present. The Chairman stated that the object was to take such action as was made necessary by the death of William B. Webb, late Treasurer, and spoke in terms of eulogy of the deceased. Attention was likewise called to the fact that during the interim between the present time and the date of the annual meeting in March next, it would be necessary to have a Treasurer pro tempore. Nominations being solicited, Howard B. French presented the name of James T. Shinn, Professor Remington that of W. Nelson Stem and Jas. T. Shinn that of Henry N. Rittenhouse. Votes were then cast for the respective candidates, Mahlon N. Kline and Dr. C. A. Weidemann being appointed tellers.

James T. Shinn offered the following resolutions, which were adopted, and the Secretary requested to carry out the instructions therein contained :

WHEREAS, An All-wise Providence has removed from our midst by death one of our oldest members, and a faithful officer of the Philadelphia College of Pharmacy ; therefore, be it

*Resolved*, That in the death of William B. Webb our College has lost a true friend, a wise counsellor and a most efficient executive officer. His devotion to the interests of his *Alma Mater* has been marked and his unflagging zeal has merited the approbation of his fellow-members.

*Resolved*, That the Philadelphia College of Pharmacy, through its officers, tender to the family of our deceased Treasurer their heartfelt sympathy in this bereavement.

*Resolved*, That an engrossed copy of these resolutions be presented to the family, and that an engrossed copy be also permanently placed in the library of the College.

The tellers being called upon to announce the result of the election for Treasurer pro tem., stated that Mr. James T. Shinn had received the highest number of votes, whereupon Mr. Shinn was declared to be elected, and upon resolution the election was made unanimous.

The Chairman presented the following resolution.

"That the executors of the estate of the late Treasurer of the Philadelphia College of Pharmacy, William B. Webb, be and they are hereby requested to transfer to James T. Shinn, Treasurer of the College, the moneys, papers, and other property which were in possession of the late Treasurer at the time of his decease."

Resolution carried. An attested copy of this resolution to be furnished the Treasurer-elect.

Mr. Shinn accepted, with some remarks. At the suggestion of the Treasurer-elect permission, by resolution, was given to him to transfer funds and papers of the College, from their present place, to the custody of the Provident Life and Trust Company, No. 401-409 Chestnut Street.

Dr. C. B. Lowe spoke of William B. Webb, his relations to the College, paying a high tribute to the worth of his character. Mr. Andrew Blair referred to

a life-long association and fellowship, and dwelt eloquently upon the fidelity and integrity with which William B. Webb performed all the duties of life and of public trust. Prof. Remington followed, stating that the Board of Trustees had placed upon their records a sense of personal loss, and of that which the College had sustained in the demise of the late Treasurer. Mr. Howard B. French referred to the faithful service which the deceased had rendered in the manifold duties pertaining to his connection as an officer, member and ardent friend of the College, and finally Mr. M. N. Kline expressed, briefly, the extent of loss sustained when an institution becomes thus deprived of the service of one long-tried, and found faithful to every duty. On motion, it was resolved that the Committee on Library be requested to have placed in suitable position a portrait of the late Treasurer of the College.

Meeting adjourned, on motion.

WILLIAM B. THOMPSON,  
*Secretary.*

## AMERICAN PHARMACEUTICAL ASSOCIATION.

*Special Membership Committee.*—"The following motion was adopted at the Chicago Meeting of the American Pharmaceutical Association." That the President be instructed to appoint a *Special Membership Committee* to consist of one member from each State and Territory and one each from the District of Columbia and the Provinces of Nova Scotia, Ontario and Quebec. The duty of said Committee shall be that of soliciting new members in their respective sections of country. They will report to and act under the direction of the Chairman of the Council, Prof. J. M. Good, St. Louis, Mo., and the Chairman of the Committee of Membership, Prof. Charles Caspari, Jr., Baltimore, Md. Considerable time has been required to secure the acceptance of distant appointees, but the earnest and enthusiastic letters received from many indicate that the great advantages of Membership are appreciated, and the present year promises to be one of exceptional progress in this direction. The thanks of the Association are due to Prof. Whelpley for the practical suggestion.

The following-named members have accepted the appointment: Alabama, Philip C. Candidus, Mobile; Arizona, Clemens L. Eschman, Phoenix; Arkansas, Wm. W. Kerr, Russellville; California, Prof. Wm. M. Searby, San Francisco; Colorado, Chas. S. Kline, Denver; Connecticut, Chas. A. Rapelye, Hartford; Delaware, John M. Harvey, Wilmington; District of Columbia, Saml. L. Hilton, Washington; Georgia, Dr. Henry R. Slack, La Grange; Idaho, Albert O. Ingalls, Murray; Illinois, T. H. Patterson, Chicago; Indiana, Josiah K. Lilly, Indianapolis; Iowa, Mrs. Rosa Upson, Marshalltown; Kansas, Mrs. M. O. Miner, Hiawatha; Kentucky, Dr. Wiley Rogers, Louisville; Maine, Edward A. Hay, Portland; Louisiana, Alex. K. Finley, New Orleans; Maryland, Prof. D. M. Culbreth, Baltimore; Massachusetts, Prof. W. L. Scoville, Boston; Michigan, Arthur S. Parker, Detroit; Minnesota, James C. Hening, Stillwater; Mississippi, John C. Means, Natchez; Missouri, Prof. H. M. Whelpley, St. Louis; Nebraska, James Reed, Nebraska City; Nevada, William A. Perkins, Virginia City; New Hampshire, Andrew P. Preston, Portsmouth; New Jersey, Wm. C. Alpers, Bayonne; New Mexico, James A. Kinnear, Deming; New York, Caswell A. Mayo, New York City; North Caro-

lina, Henry M. Cheers, Plymouth ; Ohio, Louis C. Hopp, Cleveland ; Oregon, Geo. C. Blakely, The Dalles ; Pennsylvania, Prof. Frank G. Ryan, Philadelphia ; Rhode Island, Henry J. Alfreds, Providence ; South Dakota, Irvin A. Keith, Lake Preston ; Tennessee, James O. Burge, Nashville ; Texas, L. Myers Conner, Dallas ; Utah, Frank A. Druehl, Lake City ; Vermont, Henry A. Chapin, Brattleboro ; Virginia, Edmund R. Beckwith, Petersburg ; West Virginia, Edwin L. Boggs, Charleston ; Wisconsin, John A. Dadd, Milwaukee ; Wyoming, Thos. G. Maghee, M.D., Rawlins ; Quebec, Seraphin Lachance, Montreal ; Nova Scotia, Francis C. Simson, Halifax ; Ontario, John Lowden, Toronto.

Every Pharmacist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Botany and Chemistry, who may be especially interested in Pharmacy, and *Materia Medica*, who, after duly considering the objects of the Association, and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

The large volume of proceedings issued annually to the members containing the valuable and exhaustive report on the Progress of Pharmacy, embracing all of prime value that has appeared in the leading Chemical and Pharmaceutical journals in this country and Europe, is of greater value than the membership fee.

It is hoped that the Druggists of each section will have a local pride in aiding the members of the committee representing them to present to the next annual meeting at Asheville, N. C., the largest accession of members ever secured.

The following sections have not responded, and the President would be pleased to have volunteers offer their services.

Florida, South Carolina, Washington State, North Dakota and Wyoming.

EDGAR L. PATCH,  
*President.*

*Boston, January 1, 1894.*

*Pennsylvania Pharmacy Board.*—The State Pharmaceutical Examining Board of Pennsylvania held an examination in the Central High School, at Philadelphia, on Saturday, January 20, 1894.

Three hundred and forty candidates appeared for examination, one hundred and sixty-seven applying for Registered Pharmacist Certificates, and one hundred and seventy-three for Qualified Assistant Certificates. Twenty-six of the former and sixty-four of the latter class were successful.

The next examination will be held at Harrisburg in April. Applicants for examination should apply to the Secretary of the Board, Charles T. George, Harrisburg, Pa., after the middle of March, for the necessary blank form of application, and the exact time and place of the examination. Applicants should always state, when applying for blanks, for which certificate they wish to be examined.

## MINUTES OF THE PHARMACEUTICAL MEETING.

Minutes of the Pharmaceutical Meeting, held in the Philadelphia College of Pharmacy, February 20, 1894, Edwin M. Boring in the chair. The minutes of the last meeting were read and approved. Donations to the Library were received as follows, and a vote of "Thanks of the College" was made to the donors:

### DONATIONS TO LIBRARY.

Government Reports. Department of Agriculture. Report of the Botanist. 1886, 1888, 1890, 1891, 1892.

Contributions from U. S. National Herbarium. Vol. I, Nos. 4, 5, 7, 8; Vol. 2, Nos. 1, 2; Vol. 3, No. 1; Vol. 4, Bulletin, Nos. 3, 6 (Grasses).

Special Bulletin (Agricultural Grasses and Forage Plants).

### DIVISION OF BOTANY.

Illustrations of N. A. Grasses. 2 Vols. 4to.

Consular Reports. Vol. 44, No. 160. January, 1894. Vol. 44, No. 161. February, 1894.

### SMITHSONIAN REPORTS.

Internal Work of the Wind. (Langley.)

Proceedings U. S. National Museum. Vol. 15. 1892.

Bulletin U. S. National Museum. Nos. 44, 45, 46. 1893.

### U. S. BUREAU OF EDUCATION.

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Reports on Secondary School Studies. 1893.

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W. B. Thompson spoke of the acoustic properties of the museum and moved



lina, Henry M. Cheers, Plymouth ; Ohio, Louis C. Hopp, Cleveland ; Oregon, Geo. C. Blakely, The Dalles ; Pennsylvania, Prof. Frank G. Ryan, Philadelphia ; Rhode Island, Henry J. Alfreds, Providence ; South Dakota, Irvin A. Keith, Lake Preston ; Tennessee, James O. Burge, Nashville ; Texas, L. Myers Conner, Dallas ; Utah, Frank A. Druehl, Lake City ; Vermont, Henry A. Chapin, Brattleboro ; Virginia, Edmund R. Beckwith, Petersburg ; West Virginia, Edwin L. Boggs, Charleston ; Wisconsin, John A. Dadd, Milwaukee ; Wyoming, Thos. G. Maghee, M.D., Rawlins ; Quebec, Seraphin Lachance, Montreal ; Nova Scotia, Francis C. Simson, Halifax ; Ontario, John Lowden, Toronto.

Every Pharmacist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Botany and Chemistry, who may be especially interested in Pharmacy, and *Materia Medica*, who, after duly considering the objects of the Association, and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

The large volume of proceedings issued annually to the members containing the valuable and exhaustive report on the Progress of Pharmacy, embracing all of prime value that has appeared in the leading Chemical and Pharmaceutical journals in this country and Europe, is of greater value than the membership fee.

It is hoped that the Druggists of each section will have a local pride in aiding the members of the committee representing them to present to the next annual meeting at Asheville, N. C., the largest accession of members ever secured.

The following sections have not responded, and the President would be pleased to have volunteers offer their services.

Florida, South Carolina, Washington State, North Dakota and Wyoming.

EDGAR L. PATCH,  
*President.*

*Boston, January 1, 1894.*

*Pennsylvania Pharmacy Board.*—The State Pharmaceutical Examining Board of Pennsylvania held an examination in the Central High School, at Philadelphia, on Saturday, January 20, 1894.

Three hundred and forty candidates appeared for examination, one hundred and sixty-seven applying for Registered Pharmacist Certificates, and one hundred and seventy-three for Qualified Assistant Certificates. Twenty-six of the former and sixty-four of the latter class were successful.

The next examination will be held at Harrisburg in April. Applicants for examination should apply to the Secretary of the Board, Charles T. George, Harrisburg, Pa., after the middle of March, for the necessary blank form of application, and the exact time and place of the examination. Applicants should always state, when applying for blanks, for which certificate they wish to be examined.

## MINUTES OF THE PHARMACEUTICAL MEETING.

Minutes of the Pharmaceutical Meeting, held in the Philadelphia College of Pharmacy, February 20, 1894, Edwin M. Boring in the chair. The minutes of the last meeting were read and approved. Donations to the Library were received as follows, and a vote of "Thanks of the College" was made to the donors:

### DONATIONS TO LIBRARY.

Government Reports. Department of Agriculture. Report of the Botanist. 1886, 1888, 1890, 1891, 1892.

Contributions from U. S. National Herbarium. Vol. 1, Nos. 4, 5, 7, 8; Vol. 2, Nos. 1, 2; Vol. 3, No. 1; Vol. 4, Bulletin, Nos. 3, 6 (Grasses).

Special Bulletin (Agricultural Grasses and Forage Plants).

### DIVISION OF BOTANY.

Illustrations of N. A. Grasses. 2 Vols. 4to.

Consular Reports. Vol. 44, No. 160. January, 1894. Vol. 44, No. 161. February, 1894.

### SMITHSONIAN REPORTS.

Internal Work of the Wind. (Langley.)

Proceedings U. S. National Museum. Vol. 15. 1892.

Bulletin U. S. National Museum. Nos. 44, 45, 46. 1893.

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the attention of the committee on property be called to this, with the view of having it remedied, and read a paper on Pharmacal Prerogative.

The discussion of this paper elicited the fact that the public had considerable confidence in the judgment of apothecaries, and it was shown that physicians were apt to judge hastily when emergencies required the knowledge of doses and therapeutic effect of important drugs.

Wallace Proctor gave a description of a lozenge apparatus.

Mr. L. F. Kebler read a paper on assay of vinegar of opium and sample of assay.

A vote of thanks was given to the writers of these papers and all were referred to the Publication Committee.

WILLIAM MCINTYRE,  
Registrar, *pro tem*.

## REVIEWS AND BIBLIOGRAPHICAL NOTICES.

*Auto-intoxication in Disease.* By Ch. Bouchard, translated by Thomas Oliver. 8vo. pp. 302. Philadelphia: F. A. Davis Company. London: F. J. Rebman.

The subject is treated apparently with great care, and with a closeness of detail that inspires confidence in the author's conclusions. It is entirely without the pale of the pharmacist's duty and belongs especially to the diagnostician where we leave it. The book is well printed and bound.

*Stewart's Quiz Compend of Pharmacy.* Fourth revised edition, embracing the changes of the seventh decennial revision of the U. S. Pharmacopœia. Philadelphia: Blakiston, Son & Co. 16mo, pp. 181.

The students of pharmacy will gladly welcome the appearance of a new edition of this work as being a great help to them in preparing for examination, and if it is used only as a help it is all right.

We have received a leaflet, from M. C. Tanret, reprinted from the Journal of Pharmacy and Chemistry, of Paris, giving a complete summary of the value of potassium iodohydrargyrate and potassium tri-iodide. The following classes are especially noticed, Alkaloids, Glucosides, Albuminoids, Albumin, Peptones, Gelatin, Casein and Ammonia.

*The Physician's Wife.* By Ellen M. Firebaugh. Philadelphia: F. A. Davis Company, 1914-1916 Cherry Street. 8mo, pp. 200.

A lively picture of the trials that beset the *better* half of the Country Doctor. The apothecary cannot, of course, appreciate this as will the physician, who will doubtless hand it over to his wife for perusal when her numerous duties subside sufficiently to permit her to enjoy its racy pages.

*Calendar of the Pharmaceutical Society of Great Britain* 8vo, pp. 552. London: Bloomsbury Square.

This work contains a calendar noting under the appropriate dates the various matters of interest to the members of the Society, the meetings of the various committees, the holidays, dates of examinations, the historical sketch of the

society, the charter of the society, the various acts relating to pharmacy, sales of poison and registration, the lists of members, students, prize men, tables of weights and measures, subscribers to the Benevolent Fund and Orphan Fund.

*A System of Instruction in Qualitative Chemical Analysis.* By Arthur H. Elliott, Ph.D., Professor of Chemistry and Physics, and Director of the Chemical Laboratory in the College of Pharmacy of the City of New York. Second edition. Published by the author. 1894. 8vo, pp. 120.

The first edition of this work appeared a little over a year ago, and was reviewed in this Journal, 1893, p. 107. What was said of the book then, is true of this edition; and the fact that a new edition is demanded after the lapse of so short a time, is evidence that many teachers and students have found the work a useful one.

H. T.

*An Illustrated Encyclopædic Medical Dictionary*, being a dictionary of the technical terms used by writers on medicine, and the collateral sciences in the Latin, English, French and German languages. By Frank P. Foster, M.D., with the collaboration of Wm. C. Ayres, M.D.; Edward B. Bronson, M.D.; Chas. Stedman Bull, M.D.; Henry C. Coe, M.D.; Andrew F. Currier, M.D.; Alex. Duane, M.D.; Simon H. Gage, M.D.; Henry J. Garrigues, M.D.; Chas. B. Kelsey, M.D.; Russell H. Nevins, M.D.; Burt G. Wilder, M.D. Vol. IV. New York: D. Appleton & Co. 1894. 4to. Pp. 2321 to 3096.

This volume completes a valuable and elaborate work, which cannot but be appreciated by everyone connected with the science of medicine. Partaking of an encyclopædic character, it becomes much more interesting than an ordinary dictionary. Illustrations have been inserted wherever they were found necessary to elucidate the text. The frontispiece consists of a handsome colored plate, illustrating urinary sediments. The first word of this volume is *Minnequa Springs*, and from this to the last, *Zythum*, there is not one too many. The following are a few of the titles that have received especial attention, and are of particular interest to the pharmacist: *Pilula*, *Opium*, *Morphine*, *Quinine*. A good example of the thoroughness of the work is shown under opium, where every known pharmaceutical preparation with its synonym appears to have been given. A very valuable feature of the book is the concise but clear definitions of the newer synthetic remedies. Just so much chemistry concerning them has been included, as to furnish the busy professional man with necessary information, without surrounding them by too technical language. Sixteen pages of supplement bring the whole down to the latest date possible.

Of course, such a work is not absolutely without errors. For instance, *Quercus Prinus* is given as "(yellow) Swamp Chestnut Oak." This species, however, is not yellow, and its habits are far from swampy, as it strongly inclines to rocky hillsides. *Q. Muhlenbergii* has yellow wood, and *Q. bicolor* is a chestnut oak that is found in swampy localities.

Under *Wintergreen* it is stated that the oil "when pure consists of 90 per cent. of methyl salicylate and 10 per cent. of gaultherilene." More recent investigators have shown that the latter constituent does not amount to one per cent. of the oil. A few cases of wrong pages in references, and improper spelling of authors' names, have been noticed. The mechanical part is of that high class which characterizes the Appleton Press.

H. T.

*The National Dispensatory*, containing the natural history, chemistry, pharmacy, actions and uses of medicines; including those recognized in the Pharmacopœia of the United States, Great Britain and Germany, with numerous references to the French Codex. By Alfred Stillé, M.D., LL.D., John M. Maisch, Ph.D. (late Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy), Charles Caspari, Jr., Ph.G., and Henry C. C. Maisch, Ph.G., Ph.D. Fifth edition. Philadelphia: Lea Bros. & Co. 1894. Large 8vo, pp. 1903.

The previous editions of the above work have been fully commented upon in this Journal for the year 1879, 1884 and 1887. In general arrangement, the new issue remains unchanged, and although only 122 pages larger than the previous edition, the work, as a whole, is most comprehensive and up-to-date in its information, fully maintaining its past reputation for accuracy, completeness, convenience, and absence of obsolete matter. Of national interest, then, in medical and pharmaceutical circles, is this new edition of *The National Dispensatory*. It gives not only a description of the natural history, chemistry and pharmacy of drugs and drug-actions of our own Pharmacopœia, but comments as well upon those of foreign origin. It has had many of its old articles re-written, and a large number of new ones introduced. Chemical and pharmaceutical processes are fully described, and descriptions of apparatus and tests given. The official formulas for galenical preparations seem to be fully explained, and separate formulas in customary weights and measures are added.

This latter action is to be regretted. Whilst the use of "separate formulas" is less objectionable than the former plan of inserting "equivalents" in the metric formulas, the practice will certainly handicap the general introduction of the metric system of weights and measures. Pharmacists should learn to think in and use the gram and cubic centimeter, and many will never do so with ready-made equivalents accessible.

*The National Dispensatory* has been in existence for fifteen years, and probably in no such period of time before has such a host of new remedies been introduced. The trend of modern medical practice is undeniably in the direction of synthetical compounds; and these, like the stars, are almost without number. No better evidence of this tendency in medical practice can be had than in the number of "synthetics" referred to in this work; and the wonderfully comprehensive manner in which they are described, deserves the warmest of praise. It may not be amiss, in the review, to here name a few of the more prominent and comparatively recent ones.

Antipyrine is, of course, mentioned, and also its allied compounds: Agathin, Antithermin, Benzopyrine or Antipyrine Benzoate, Iodopyrine, Phenopyrine, Picropyrine, Naphthopyrine, and Salipyrine or Antipyrine Salicylate. Acetanilid is described, and also certain allied compounds: Bromacetanilid, Benzanilid, and Methyl-acetanilid or "Exalgin." A process for the last named is given (p. 9). Phenacetin or Para-acetphenetidin is referred to, as are Methacetin, Hydracetin, Phenylhydrazine and Phenocoll Hydrochloride. Phenocoll Salicylate, which seems to be coming into use, is not mentioned.

Urethane or Ethyl Carbamate, and Ural or Chloral-Urethane are given. "Somnal" is defined as Ethylated Chloral-Urethane, a definite chemical compound. It has been reported to be simply a solution of chloral and urethane in alcohol (Merck's *Report*, 1893, p. 8). Mention is also made of Euphorin or



Phenyl Urethane, a non-toxic antipyretic. (This should *not* be confounded with Europhen or Iso-Butyl-Ortho-Cresol Iodide, an iodoform substitute containing nearly one-fourth combined iodine). The *Dispensatory* errs, most decidedly, in calling Phenyl Urethane—*Europhin* (p. 1674); and the greatest care should be exercised by the pharmacist to neutralize this blunder, as Europhen—with which *Euphorin* is likely to be confounded—brought in contact with water, splits up into iodine, and a new and soluble iodine compound. The dangers of administering free iodine in the form of 1 to 2 gram doses of Europhen, when Euphorin is wanted are too obvious to need mention.

"Aristol" is referred to as Dithymol-diiodide or Annidalin, and a process for making is given (p. 879). "Antiseptol" or Cinchonine Iodosulphate, Iodol or Tetraiodopyrrol—one of the oldest of iodoform substitutes—Soziodol, Sozal, Sulphaminol and Thiophene are described. "Dermatol" is given a synonym of Bismuth Subgallate, and a process of manufacture is detailed (p. 345). "Diuretin" is defined as Sodio-Theobromine Salicylate, and has a process of making given (p. 1481). "Diaphtherin" (*not* Diphtherin), or Oxyquinaseptol is mentioned, and the method of obtaining it given (p. 451).

The following are also reviewed: Alumol, Naphtol, Benzonaphtol, Betol or Salinaphtol, Hydronaphtol, Thiol—the German artificial Ichthyol—Tumenol, allied to Ichthyol, Lysol, Creolin, Naphtalin and derivatives, Piperazine—the uric acid solvent—Resorcin, Terebene, Terpin Hydrat, Camphoric Acid, Paraldehyde, Metaldehyde, Sulphonal and allied hypnotics—Trional and Tetronal, Guaiacol and Guaiacol Carbonate, Benzoate and Salicylate, Chloralamide, Cocaine Phenylate, etc.

Under Ethylene Bromide (p. 141) the too-common error is repeated of describing it as "a faintly brown-colored liquid." The pure compound is a *colorless* liquid, readily decomposable into iodine and other products. Its boiling point is stated to be 131° C. Wöhler gives it as 129° C.

One of the most valuable features of *The National Dispensatory*, in the past, has been its up-to-date references concerning plant constituents. This reputation seems to have been well maintained in the present issue, save in some few cases.

Under the composition of volatile oil of juniper (p. 1127) the indefinite statement is made that it is a mixture of  $(C_{10}H_{16})$ —hydrocarbons differing in boiling points. Flückiger (1888) has shown that it is composed essentially of two hydrocarbons, the more abundant of which when heated to 270° is changed to a hydrocarbon  $(C_{10}H_{16})$  corresponding to cinene of oil of wormseed.

Under oil of hedeoma, the statement only is made that it "contains oxygen, but its exact composition has not been ascertained," despite the excellent work of E. Kremers (A. J. P., 1887, p. 535), and F. W. Franz (A. J. P., 1888, p. 161), who found hedeomol, and formic and acetic acids. Franz also found certain oxygenated liquids. Kremers believes that isoheptoic acid is present.

Further, whilst reference is made under the constituents of Caulophyllum to the experiments of Lloyd, anent the alkaloid caulophylline—reported by him to the American Pharmaceutical Association last August—no mention is made of leontin, a compound related to saponin, previously isolated by Lloyd, and mentioned in the discussion following his paper on Caulophylline. (See Proceedings, A. P. A., 1893, p. 117.)

In the description of the properties of morphine acetate, the statement is

made that, freshly made, it dissolves at 15° C. in 25 parts of water and 476 parts of alcohol (U. S. P.) This is an obvious typographical error; 25 parts of the first named, and 476 parts of the second named are meant.

The appendix contains a number of new and valuable tables, and an alphabetical list of official drugs of the United States and British Pharmacopœias, showing contained preparations. A list is also given of over four hundred formulas and molecular weights of chemical compounds. The indices show 25,000 references, and the typographical make-up of the book is well worthy of the high reputation of the house issuing it.

J. W. ENGLAND.

*Proceedings of the Twelfth Annual Meeting of the Virginia Pharmaceutical Association.*

A copy of the above has just reached us. It details the minutes of the meeting held at Blue Ridge Springs, September 13 and 14, 1893. The noteworthy paper in this volume is entitled "A Few Facts and Points about Quinine, Gathered Here and There, and Strung Together by Robert Brydon." The author of this unique contribution has succeeded in collecting facts and statistics about one of the greatest of the alkaloids, that will well repay one for reading. He has drawn his information from a great many sources, notably from some of our large manufacturing houses, whereby the value of his communication is especially increased.

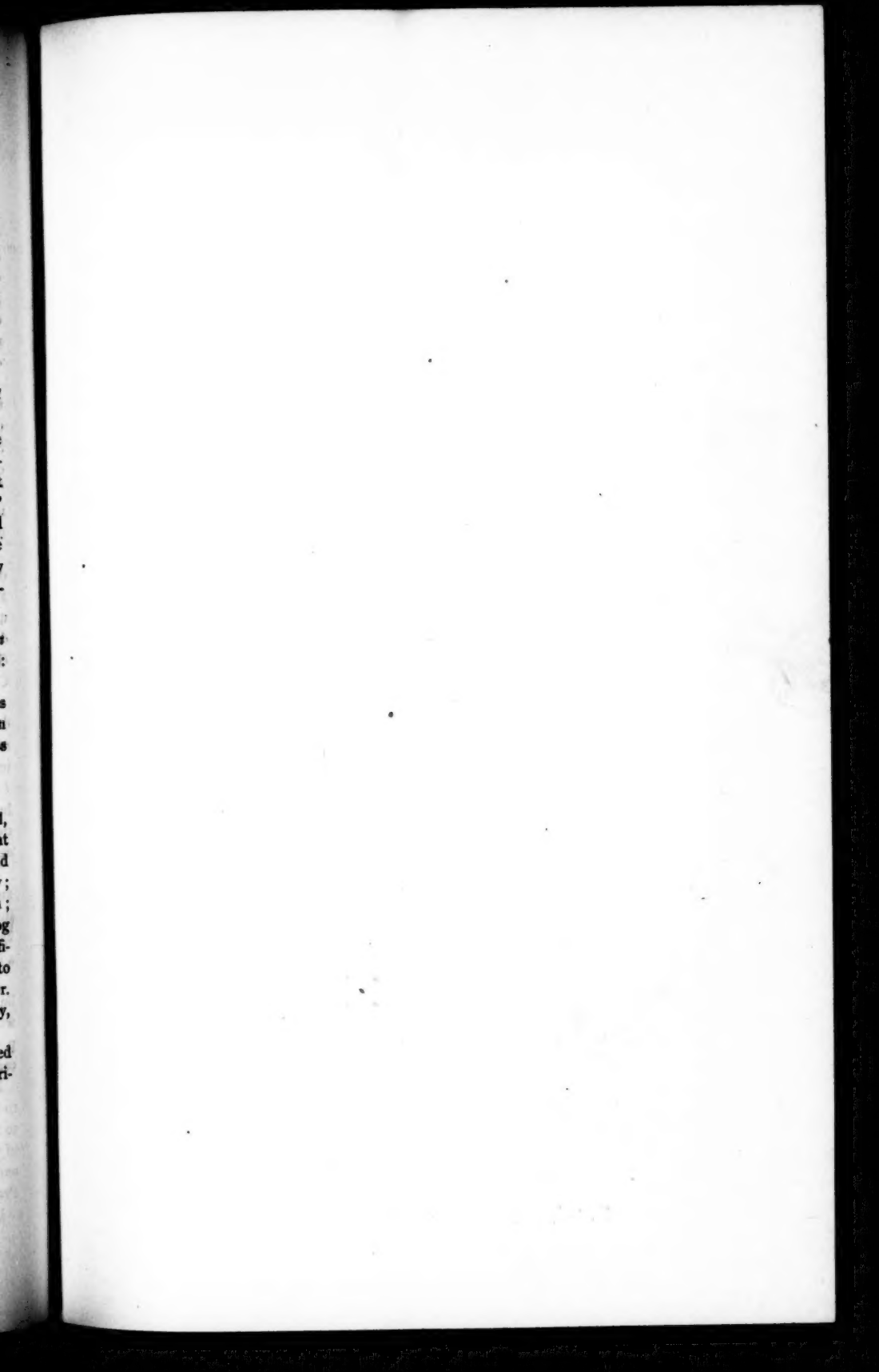
*The Modern Climatic Treatment of Invalids with Pulmonary Consumption in Southern California.* By P. C. Remondino, M.D. Pp. 126. Detroit: George S. Davis. 1893.

A very readable book, which is of interest to the ordinary tourist as well as to the invalid, since it gives some very sensible advice about travelling in general, which every one should know, especially that which refers to dress and diet.

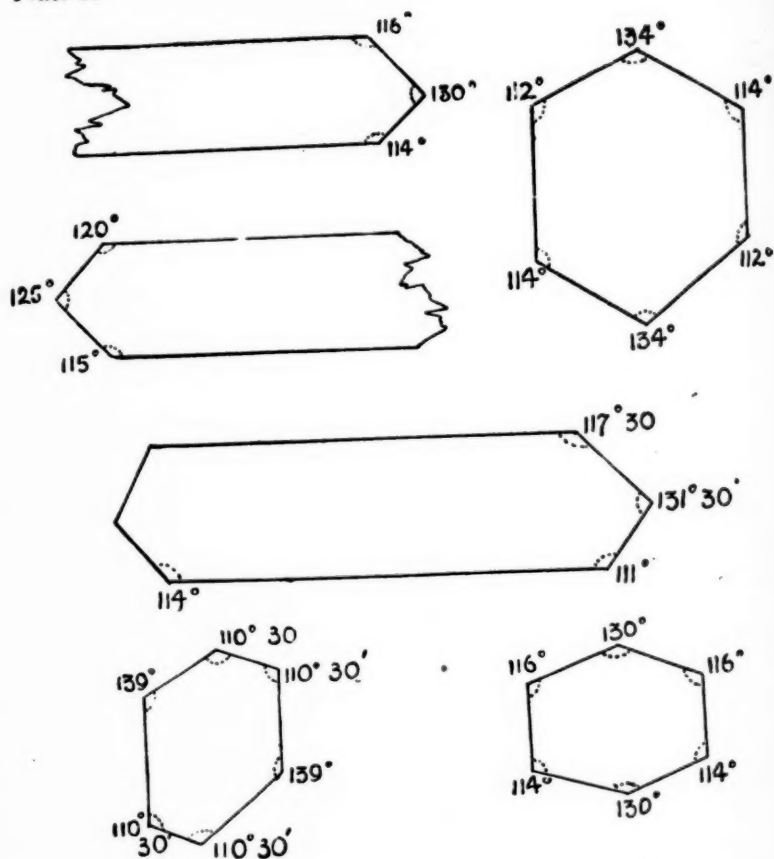
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*The Georgia Board of Pharmacy* met in the Senate Chamber of the Capitol, Atlanta, February 26. Messrs. Goodwyn, Sharp, Payne and Slack were present and conducted the examination of ten applicants, six of whom passed and four failed. The successful candidates were: Messrs. W. M. Caldwell, Chipley; O. B. Hartzog, Atlanta; R. C. Hood, Harmony Grove; H. T. Mash, Savannah; R. K. Nipper, Bainbridge, and L. C. Newman, of Atlanta. Mr. O. B. Hartzog made the highest mark and was awarded the complimentary interstate certificate. The Board also took action on the adulteration law and hopes soon to enforce the same throughout the State. Complaints should be made to Dr. George F. Payne, State Chemist, Atlanta, or Dr. H. R. Slack, Secretary, Lagrange.

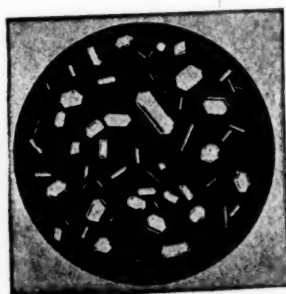
The Sprague medal and the prize membership in the A. P. A. will be awarded when the Board meets with the Georgia Pharmaceutical Association in Americus, May 7.



Platz I.



A



B

Solnine, from *Solanum Carolinense*.